

# PROPOSAL

## Old DEN6301C: Fundamentals of Oral & Maxillofacial Radiology/ New (DEN5301 or 5302): Fundamentals of Oral & Maxillofacial Radiology

Proposed Fall 2022 (if approved by the UFCD Curriculum Committee in December 2021 and forwarded to UCC)

### Course Description:

The production, properties of radiation, radiation biology and safety along with radiographic techniques for procuring digital intra-oral images.

### I. General Information

#### Course Director:

Course Director: Anita Gohel  
Office:  
Email: [AGohel@dental.ufl.edu](mailto:AGohel@dental.ufl.edu)  
Phone: (352) 273-6775  
Course Credits: 1  
Semester: 1-Summer

#### Contributing Faculty

Rutvu Vyas (352) 273-6690 [rvyas@dental.ufl.edu](mailto:rvyas@dental.ufl.edu)  
Mayank Pahadia (352) 273-6692 [mayankpahadia@dental.ufl.edu](mailto:mayankpahadia@dental.ufl.edu)

#### Support Staff

Deborah Engstrom (352) 273-6775 [DEngstrom@dental.ufl.edu](mailto:DEngstrom@dental.ufl.edu) TA / Grade Administrator

### II. Course Goals

This course is designed to introduce basic radiology concepts to pre-doctoral dental students. Students will gain knowledge of the basic concepts of how x-rays are created and interact as well as a familiarity with dental radiographic techniques. This course includes training of students to analyze the biological effects of ionizing radiation and focuses on the influence of current literature on radiation to develop analytic and critical thinking skills and prepare students to be life-long learners.

This course also serves as an introductory course for the Advanced Radiographic Interpretation course, where students expand their knowledge of dental radiology including interpretation of radiographs.

### III. Course Overview

This is an online course which includes lectures, some case discussions and, one group project. Students will be expected to review recorded lectures and successfully complete four online quizzes (see schedule with assignments).

### IV. Course Outline

#### A. Introduction

1. Radiology in dental practice
2. Radiographic imaging

#### B. Intraoral Digital Radiography

1. Principles of digital Imaging
2. CCD/CMOS and Phosphor sensors
3. Imaging theory/shadow casting
4. Bisecting-angle technique
5. Paralleling technique
6. Bitewing radiography
7. Accessory techniques
8. Criteria of image acceptability
9. Technique errors
10. Sensor holding instruments
11. Pediatric dental radiography
12. Edentulous radiography

#### C. Radiation Physics

1. Atomic structure; characteristics of radiation
2. X-ray machine components
3. Mechanisms of x-ray production
4. Factors affecting the x-ray beam
5. Interactions of x-rays and matter

#### D. Radiographic Image Characteristics

1. Density
2. Contrast
3. Sharpness/resolution
4. Factors affecting image characteristics

#### E. Radiobiology, Safety and Protection

1. Units of measurement
2. Atomic level effects – ionization

3. Direct vs. indirect effects/target theory
4. Tissue effects
5. Whole body effects
6. Cumulative effects
7. Radiation doses in dentistry
8. Occupational doses
9. Non occupational doses
10. Effects of radiation therapy on Oral Tissues
11. Methods for radiation exposure reduction
  - a. Patient
  - b. Staff
12. Statutory regulations

## V. Course Material

### Required Texts:

White and Pharoah, Oral Radiology – Principles and Interpretation, 8<sup>th</sup> Ed. C.V. Mosby, 2018.

Articles provided by the instructor in Canvas.

### Recommended Texts:

Wheeler's Dental Anatomy and Occlusion, Ash and Nelson, 10th Edition, Saunders, 2015, ISBN: 0323263232

### Supplemental Reading:

Dental Anatomy and 3-D Interactive Tooth Atlas, Brown & Herbranson Imaging

A free 2 week trial and/or purchase the product directly through their website at [ehuman.com](http://ehuman.com).



Additional Materials:

[HSC Dental Library Guide](#)

## VI. Course Objectives

Lectures, suggested reading assignments, and group project will be the primary teaching methods for this course. Students are encouraged to seek help when needed.

1. Introduction
  1. Describe the role of radiology in modern dental practice.
  2. Explain and understand basic terminology used in radiology.
2. Intraoral Radiography
  1. Describe basic shadow casting requirements for an ideal radiographic image.
  2. Describe the theory, correct patient positioning and film placement, and exposure of intraoral radiographs using the paralleling or bisecting-angle technique.
  3. Describe and understand the steps in obtaining adequate bitewing radiographs.
  4. State the purposes of periapical, bitewing, and occlusal radiographs.

5. Describe the techniques for occlusal and distal oblique intraoral radiographs.
  6. Identify the criteria of acceptability for each intraoral projection.
  7. Identify and correct various intraoral radiographic technique errors.
  8. Identify the rationale for using sensor holders in intraoral radiography.
  9. Identify the differences in the type and numbers of films used for the adult dentulous, edentulous, and survey.
  10. Identify advance preparations required before exposing dental radiographs.
3. Radiation Physics
1. Describe the atom and its structure.
  2. Locate the position of x-radiation on the electromagnetic spectrum.
  3. List seven properties of x-rays.
  4. Differentiate between ionizing and non-ionizing radiation.
  5. Differentiate between particulate and electromagnetic radiation.
  6. Describe the functions and locate diagrammatically the various components of a dental x-ray machine.
  7. Describe two mechanisms for x-ray production.
  8. Describe the effects of various technique factors (mA, time, kVp), distance (inverse square law), filtration,
4. Radiobiology, Safety, and Protection
1. Define basic conventional and international units of radiation measurement.
  2. Describe the effects of ionization on biologic macromolecules.
  3. Describe direct and indirect effects of radiation and state the Target Theory.
  4. Describe the effects of radiation at the tissue/organ system level.
  5. Describe the effects of radiation at the whole body level.
  6. Differentiate between somatic and genetic effects of radiation.
  7. Define stochastic and non-stochastic effects of radiation.
  8. Describe the cumulative effects of radiation.
  9. Describe the theories of linear and non-linear responses to radiation dose and define the concept of ALARA.
  10. Describe the latent period and how it relates to dose, dose rate and radiation type.
  11. Describe the concepts of acute and chronic exposure to radiation.
  12. Identify approximate skin exposure levels associated with various types of dental radiographic procedures.
  13. Identify the maximum permissible dose (MPD) for occupationally exposed persons.
  14. Identify methods for reducing and monitoring radiation exposure to dental office personnel.
  15. Define selection criteria and explain their use in oral radiology.
  16. Describe various methods for dose reduction to the patient during dental radiography.
  17. Describe federal or state regulations regarding dental radiography.
  18. Describe the effects of radiation therapy on oral cavity and ways to manage a patient undergoing radiation therapy in the head and neck region.
5. Computers in Dentistry and Digital Radiography
1. Describe the advantages and disadvantages of digital imaging
  2. Describe various types of sensors
  3. Define spatial resolution and gray levels.
  4. Describe digital enhancement of images
  5. Describe optimal viewing of digital images
  6. Describe errors and corrections of digital images

## VII. Course Competencies

This course teaches to the following competencies in the ["Competencies for the New Dental Graduate"](#).

### Domain VI: Patient Care

#### A. Assessment, Diagnosis, and Treatment

12: Patient Assessment, Diagnosis, Treatment Planning and Informed Consent: Provide oral health care within the scope of general dentistry to include patient assessment, diagnosis, comprehensive treatment planning, prognosis, and informed consent.

#### B. Establishment and Maintenance of Oral Health

25: Provide oral health care within the scope of general dentistry to include oral mucosal and osseous disorders.

26: Provide oral health care within the scope of general dentistry to include screening and risk assessment for head and neck cancer.

## VIII. Evaluation

1. Four quizzes (10 points each, 40%), group project (20%) and a final comprehensive exam (40%). Exams and quizzes will be multiple choice questions. These assessments will include some images.
2. During the examination, no additional help will be provided by faculty/proctors.

### Remediation:

A student that receives an "E" grade must meet with the Course Director to review their examination. A remediation examination is then scheduled for the student.

## IX. Administrative Practices

Administrative practices for all UFCD courses are universally applied. Exceptions to or deviations from these practices are stated in the individual syllabi by the course director. When not individually stated in the syllabus, course administrative practices default to those identified under "Course Policies" on the DMD Student Website:

<https://dental.ufl.edu/education/dmd-program/course-policies/>

## X. Grade Scale

<b>Method</b>	Letter Grade
<b>Scale</b>	100
<b>Tolerance</b>	0.5 (Final letter grades within this range will be rounded up.)

<b>A</b>	95 - 100
<b>A-</b>	90 - 95
<b>B+</b>	87 - 90
<b>B</b>	84 - 87
<b>B-</b>	80 - 84
<b>C+</b>	76 - 80
<b>C</b>	72 - 76
<b>E</b>	0 - 72

Proposed Course Schedule for calculating credit hours

Lecture or Lab #	Topic	Date	Start and End time or minutes	Instructor
L-1	Orientation/Course Expectations Properties of X-rays	TBD	50 minutes	Dr. Gohel
L-2	X-ray production X-ray tube		50 minutes	Dr. Gohel
Lab -1	Hand-held X-ray tube		2 hour	Dr. Gohel
L-3	X-ray absorption		50 minutes	Dr. Gohel/Pahadia/Vyas
L- 4	Biological effects of radiation		50 minutes	Dr. Gohel
L-5	Effects of radiation therapy on maxillofacial tissues		50 minutes	Dr. Gohel
L-6	Radiation protection		50 minutes	Dr. Gohel/Pahadia/Vyas
L-7	Introduction to digital imaging		50 minutes	Dr. Gohel/Pahadia/Vyas
L- 8	Digital image characteristics		50 minutes	Dr. Gohel/Pahadia/Vyas

L-9	Principles of shadow-casting		50 minutes	Dr. Gohel/Pahadia/Vyas
L-10	Intra-oral images and surveys		50 minutes	Dr. Gohel/Pahadia/Vyas
L-11	Selection criteria for intra-oral imaging		50 minutes	Dr. Gohel/Pahadia/Vyas
L-12	Extra-oral imaging		50 minutes	Dr. Gohel/Pahadia/Vyas
L-13	Review		50 minutes	Dr. Gohel

# PROPOSAL

## Old DEN6301C: Fundamentals of Oral & Maxillofacial Radiology/ New (DEN5302C or DEN5303C): Radiographic Techniques and Interpretation

Proposed Spring 2023

### Course Description:

Advanced radiographic techniques including cephalometric, panoramic and CBCT imaging along with interpretation of normal and incidental radiographic findings and interpretation of caries, periodontal and apical pathology.

## I. General Information

### Course Director:

Course Director: Anita Gohel  
Office:  
Email: AGohel@dental.ufl.edu  
Phone: (352) 273-6775  
Course Credits: 2  
Semester: Spring

### Contributing Faculty

Rutvu Vyas (352) 273-6690 [rvyas@dental.ufl.edu](mailto:rvyas@dental.ufl.edu)  
Mayank Pahadia (352) 273-6692 [mayankpahadia@dental.ufl.edu](mailto:mayankpahadia@dental.ufl.edu)

### Support Staff

Deborah Engstrom (352) 273-6775 [DEngstrom@dental.ufl.edu](mailto:DEngstrom@dental.ufl.edu) TA / Grade Administrator

## II. Course Goals

This course is designed to introduce advanced imaging techniques including panoramic and CBCT imaging. The course includes training of students to appropriately apply imaging principles and clinical findings to select an imaging study most appropriate for each diagnostic task based on current literature and evidence-based practices. The students will also learn to interpret common dental diseases such as caries, periodontal disease and periapical pathology. This course also serves as an introductory course for the Advanced Radiographic Interpretation

course, where students expand their knowledge of dental radiology including systematic interpretation of radiographs.

### III. Course Overview

This is a combined online lecture course which includes some case discussions and one group project. Students will be expected to review recorded lectures and successfully complete four online quizzes (see schedule with assignments).

### IV. Course Outline

#### A. Introduction

1. Radiology in dental practice
2. Radiographic imaging

#### B. Intra-oral radiograph interpretation

1. Intra-oral anatomy
2. Object localization
3. Radiographic diagnosis of caries, periodontal and apical pathology

#### C. Extraoral and Panoramic Radiography

1. Tomographic imaging theory
2. Panoramic radiography
  - a. Principles and image formation
  - b. Real and ghost image
  - c. Normal panoramic anatomy
  - d. Positioning errors identification and corrections
  - e. Interpretation of the panoramic image
  - f.
3. Other specialized imaging
  - a. MDCT
  - b. MRI
  - c. Ultrasound
  - d. Nuclear Medicine

#### D. Cone Beam Computed tomography

1. Principles of CBCT technology
2. CBCT acquisition and image reconstruction
  - a. Volume acquisition
  - b. Voxels and Field of view
  - c. Projection Geometry
3. CBCT image quality
  - a. Spatial resolution
  - b. Contrast resolution
  - c. Noise
  - d. Artifacts
4. CBCT display and reformat
  - a. Orthogonal Display
  - b. MPR display

- c. 3D volume rendering
5. Selection criteria recommendations
6. CBCT anatomy
7. CBCT incidental findings
8. Airway analysis
9. Implant imaging
10. Medico-legal issues

E. Selection criteria of intra-oral and extra-oral images

F. Introduction to PACS

1. MiPACS image analysis and enhancements
2. Image archiving and image formats

## V. Course Material

### **Required Texts:**

White and Pharoah, Oral Radiology – Principles and Interpretation, 8<sup>th</sup> Ed. C.V. Mosby, 2018.

Articles provided by the instructor in Canvas.

### **Recommended Texts:**

Wheeler's Dental Anatomy and Occlusion, Ash and Nelson, 10th Edition, Saunders, 2015, ISBN: 0323263232

### **Supplemental Reading:**

Dental Anatomy and 3-D Interactive Tooth Atlas, Brown & Herbranson Imaging

A free 2 week trial and/or purchase the product directly through their website at [ehuman.com](http://ehuman.com).



Additional Materials:

[HSC Dental Library Guide](#)

## VI. Course Objectives

Lectures, suggested reading assignments, and group project will be the primary teaching methods for this course. Students are encouraged to seek help when needed.

1. Introduction
  - Apply the role of information technology in a contemporary dental practice.
  - Apply critical thinking and problem-solving skills in the radiographic diagnosis and comprehensive patient management.
2. Intraoral Radiography

1. Be able to interpret normal anatomy and identify common dental diseases such as caries, periodontal disease and periapical pathology
2. Be able to localize an object in intra-oral images
3. Extraoral and Panoramic Radiography
  1. Describe the general principles of and indications for panoramic radiography.
  2. Identify normal anatomic structures and ghost shadows on panoramic projections.
  3. Describe the various extraoral and specialized imaging that may be encountered in dental medicine, and indications for their use.
4. Basic Principles of Radiological Interpretation
  1. Describe the "radiologic" method of reviewing radiographs for normal, normal variants, and pathologic entities and list seven parameters for describing radiologic pathology.
  2. Describe basic radiographic optical illusions that may interfere with routine film interpretation.
  3. Describe optimal conditions for viewing radiographs.
  4. Identify normal anatomic landmarks on intraoral and panoramic radiographs.
  5. Identify various dental restorative materials when seen on radiographs.
5. Cone-beam CT imaging
  1. Describe CBCT technology, field of view and voxel size.
  2. Discuss the options to limit radiation exposure to the patient.
  3. Evaluate the risks and benefits of CBCT examinations
  4. Be familiar with image reformatting and volume rendering techniques
  5. Identify artifacts in CBCT images and be familiar with methods to reduce these artifacts.
  6. Discuss recommendations regarding CBCT selection criteria
  7. Discuss the ethical and medico-legal considerations of CBCT
  8. Identify normal anatomic structures in multiplanar sections
  9. Be able to systematically review and interpret a CBCT scan
  10. Recognize common abnormalities and incidental findings in CBCT images
  11. Understand the role of CBCT in implant imaging and airway analysis.
6. Introduction to PACS
  1. Image enhancements for optimal diagnosis
  2. Image analysis tools
  3. Image archiving and formats

## VII. Course Competencies

This course teaches to the following competencies in the ["Competencies for the New Dental Graduate"](#).

### Domain VI: Patient Care

#### A. Assessment, Diagnosis, and Treatment

12: Patient Assessment, Diagnosis, Treatment Planning and Informed Consent: Provide oral health care within the scope of general dentistry to include patient assessment, diagnosis, comprehensive treatment planning, prognosis, and informed consent.

#### B. Establishment and Maintenance of Oral Health

25: Provide oral health care within the scope of general dentistry to include oral mucosal and osseous disorders.

26: Provide oral health care within the scope of general dentistry to include screening and risk assessment for head and neck cancer.

## VIII. Evaluation

1. Four quizzes (10 points each, 40%), group project (20%) and a final comprehensive exam (40%). Exams and quizzes will be multiple choice questions. These assessments will include some images.
2. During the examination, no additional help will be provided by faculty/proctors.

### Remediation:

A student that receives an "E" grade must meet with the Course Director to review their examination. A remediation examination is then scheduled for the student.

## IX. Administrative Practices

Administrative practices for all UFCD courses are universally applied. Exceptions to or deviations from these practices are stated in the individual syllabi by the course director. When not individually stated in the syllabus, course administrative practices default to those identified under "Course Policies" on the DMD Student Website:

<https://dental.ufl.edu/education/dmd-program/course-policies/>

## X. Grade Scale

<b>Method</b>	Letter Grade
<b>Scale</b>	100
<b>Tolerance</b>	0.5 (Final letter grades within this range will be rounded up.)
<b>A</b>	95 - 100
<b>A-</b>	90 - 95
<b>B+</b>	87 - 90
<b>B</b>	84 - 87

B-	80 - 84
C+	76 - 80
C	72 - 76
E	0 - 72

Proposed Course Schedule for calculating credit hours

Lecture or Lab #	Topic	Date	Start and End time or minutes	Instructor
L-1	Orientation/Course Expectations Radiology in a dental practice	TBD	50 minutes	Dr. Gohel
L-2	Sensor placement		50 minutes	Dr. Gohel
L-3	Errors in digital radiography		50 minutes	Dr. Gohel/Pahadia/Vyas
L-4	Intra-oral anatomy: Maxilla		50 minutes	Dr. Gohel/Pahadia/Vyas
L-5	Intra-oral anatomy: Mandible		50 minutes	
L-5	Principles of panoramic radiology		50 minutes	Dr. Gohel
L-6	Panoramic anatomy		50 minutes	Dr. Gohel
L-7	Panoramic positioning and other errors Interpreting the panoramic image		50 minutes	Dr. Gohel
L- 8	Specialized imaging in dental radiology		50 minutes	Dr. Gohel/Pahadia/Vyas
L-9	Principles of CBCT technology		50 minutes	Dr. Gohel
L-10	CBCT image quality and artifacts		50 minutes	Dr. Gohel/Pahadia/Vyas
L-11	CBCT anatomy		50 minutes	

L-12	CBCT selection criteria		50 minutes	Dr. Gohel/Pahadia/Vyas
L-13	Incidental findings in CBCT scans		50 minutes	Dr. Gohel/Pahadia/Vyas
L-14	CBCT airway analysis Medico-legal issues with CBCT imaging		50 minutes	Dr. Gohel
Lab-1	CBCT image display Mandibular nerve tracing, Evaluation of impacted teeth. Implant planning		2 hours	Dr. Gohel/Pahadia/Vyas
L-15	Radiology of dental caries		50 minutes	Dr. Gohel
L-16	Radiology of periodontal disease		50 minutes	Dr. Gohel/Pahadia/Vyas
L-17	Radiology of periapical pathology		50 minutes	Dr. Gohel/Pahadia/Vyas
L-18	Introduction to MiPACS: Image analysis and enhancements Image formats		50 minutes	Dr. Gohel
	Review		50 minutes	Dr. Gohel/Pahadia/Vyas
Lab-2	DXTTR training		2-3 hours	Dr. Gohel/Pahadia/Vyas

# PROPOSAL

## OLD DEN8303 Advanced Radiologic Interpretation/New DEN6303 or 6304 Advanced Radiologic Interpretation

Fall 2022 or Spring 2023

### Course Description:

The series of topics on radiographic diagnosis is designed to reinforce concepts that systematic interpretation with conventional and CBCT images assist in the diagnosis of patient abnormalities including developmental, trauma, inflammation, systemic and bone diseases, soft tissue calcifications and neoplasia.

### General Information

#### Course Director:

Course Director: Anita Gohel

Office:

Email: [AGohel@dental.ufl.edu](mailto:AGohel@dental.ufl.edu)

Phone: (352) 273-6775

Course Credits: 1

Semester: Spring

#### Contributing Faculty

Rutvi Vyas	(352) 294-5576	<a href="mailto:RVyas@dental.ufl.edu">RVyas@dental.ufl.edu</a>
Mayank Pahadia	(352) 273-6692	<a href="mailto:mayankpahadia@dental.ufl.edu">mayankpahadia@dental.ufl.edu</a>

Deborah Engstrom (352) 273-6775 [DEngstrom@dental.ufl.edu](mailto:DEngstrom@dental.ufl.edu) TA / Grade Administrator

Marwa Almahndr	(713) 315-0122	TA
Karen Gaines	(352) 555-1212	TA
Sergio Palacios	(352) 273-5950	TA

## II. Course Goals

The goals of this course are to present systematic analysis of both conventional and CBCT images. The students will also learn radiographic features of various jaw diseases including cysts, tumors, fibro-osseous lesions, systemic disease, infections and developmental diseases affecting the oral tissues. The intent of the course is to familiarize the student with the radiologic diagnostic features of diseases of the oral and maxillofacial complex.

## III. Course Overview

The course format will include lectures and case conferences. Multiple cases will be presented as formative learning throughout the course. The lectures will be conducted on Zoom and will be recorded.

The students are to attend and participate in all zoom lecture presentations. Video recordings will be available if illness or emergencies arise so that students may keep up with the material. Course materials will be posted on the course Canvas site at least 2 business days prior to the relevant class activity. These course materials include the presentations slides as pdf files. The course materials will be posted on the canvas website under modules.

## IV. Course Outline

Understanding and recognizing normal versus abnormal is crucial for proper radiographic diagnosis. The case-based lectures will include:

A: Radiographic features of normal and abnormal findings

B: Understanding various disease processes including cysts, tumors, infections, developmental anomalies, diseases of bone and systemic diseases

C: Analyzing the radiographic features to differentiate between a benign and aggressive disease process

Proper radiographic diagnosis includes evaluating the lesions systematically:

A. Patient history and clinical information

B. Location and shape

C. Margins and zone of transitions of the lesion

D. internal matrix

E. Location and distribution

F. Effect of the lesion on surrounding structures

G. Periosteal reactions

H. Presence of soft tissue component

I: Synthesizing the findings to create an appropriate radiographic differential diagnosis

## V. Course Material

**REQUIRED TEXTBOOK:** White and Pharoah, *Oral Radiology – Principles and Interpretation*, 8<sup>th</sup> Ed. C.V. Mosby, 2019 (required in DEN 6301C.)

**ADDITIONAL READING:**

Gohel A, Villa A, Sakai O; Benign jaw lesions, Dent Clin North Am. 2016 Jan; 60(1):125-41 (required)

Alamri HM1, Sadrameli M, Alshalhoob MA, Sadrameli M, Alshehri MA; Applications of CBCT in dental practice: a review of the literature. Gen Dent. 2012 Sep-Oct;60(5):390-400 (required)

Dental radiographic examinations: recommendations for patient selection and limiting radiation exposure. FDA/ADA (2012)(required)

Mardini S, Gohel A; Imaging of Odontogenic Infections Radiol Clin North Am. 2018 Jan;56(1):31-44. (optional)

**Optional resource:**

[HSC Dental Libirary Guide - includes ebooks](#)

## VI. Course Objectives

Upon completion of the course, the student should be able to:

1. Apply critical thinking and problem-solving skills in the radiographic diagnosis and comprehensive patient management
2. Demonstrate knowledge of image interpretation and analysis.
3. Demonstrate knowledge of how to interpret disorders affecting the teeth.
4. Demonstrate knowledge of the diagnosis of benign jaw lesions
5. Demonstrate knowledge of malignant and metastatic jaw lesions
6. Demonstrate knowledge of inflammatory processes in the maxillofacial region

7. Describe and correctly identify the radiographic signs of trauma to teeth, mandible and facial bones.
8. Describe the relationship of developmental abnormalities of the oro-facial complex with generalized congenital and acquired developmental abnormalities.
9. Demonstrate knowledge of systemic and metabolic diseases and dysplasias affecting the maxillofacial region
10. Describe the various imaging modalities for TMJ imaging and identify the radiographic signs of abnormalities to the TMJ.
11. Describe the various imaging modalities for implant imaging and implant treatment planning, radiographic signs of implant failures.
12. Understand disorders affecting the paranasal sinuses, especially the maxillary sinus.
13. Identify soft tissue calcifications

## VII. Course Competencies

This course teaches the following competencies in the "Competencies for the New Dental Graduate".

### Domain I: Critical Thinking

- 1: Critical Thinking: Use critical thinking and problem-solving, including their use in the comprehensive care of patients, scientific inquiry and research methodology.
- 3: Apply biomedical science knowledge in the delivery of patient care.

### Domain II: Professionalism

- 5: Legal Standards: Apply legal and regulatory concepts related to the provision and/or support of oral health care services.

### Domain VI: Patient Care

#### A. Assessment, Diagnosis, and Treatment

- 12: Patient Assessment, Diagnosis, Treatment Planning and Informed Consent: Provide oral health care within the scope of general dentistry to include patient assessment, diagnosis, comprehensive treatment planning, prognosis, and informed consent.

#### B. Establishment and Maintenance of Oral Health

- 25: Provide oral health care within the scope of general dentistry to include oral mucosal and osseous disorders.
- 26: Provide oral health care within the scope of general dentistry to include screening and risk assessment for head and neck cancer.

## VIII. Evaluation

Student Assessment includes:

There will be group and individual case assignments that will contribute 70% of the grade. The final examination will be a case-based with multiple choice format and will be CUMULATIVE in nature. The final examination will consist of about 60 questions.

The final grade will be computed as follows:

Case assignments:                70%

Final Examination:                30%

### Remediation:

Students that receive an E grade in this course must meet with the course director to establish a remediation plan. This remediation may be in the form of a case-based oral or written examination. The highest exam grade possible after remediation would be a remediated C grade. Please see "Administrative Practices" Tab for detail on final grade determination.

## IX. Administrative Practices

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## X. Grade Scale

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<b>A-</b>	90 - 95
<b>B+</b>	87 - 90
<b>B</b>	84 - 87
<b>B-</b>	80 - 84
<b>C+</b>	76 - 80
<b>C</b>	72 - 76
<b>E</b>	0 - 72

Proposed Course Schedule for calculating credit hours

Lecture or Lab #	Topic	Date	Start and End time or minutes	Instructor
L-1	Orientation/Course Expectations		50 minutes	Dr. Gohel
L-2	Principles of Radiographic Interpretation		50 minutes	Dr. Gohel
L-3	Radiology of Benign Odontogenic and Non-odontogenic cysts		50 minutes	Dr. Gohel/Pahadia/Vyas
L-4	Radiology of Benign tumors and neoplasms		50 minutes	Dr. Gohel/Pahadia/Vyas
L-5	Dental anomalies imaging		50 minutes	Dr. Gohel/Pahadia/Vyas
L-6	Imaging of Inflammatory conditions of the Jaws		50 minutes	Dr. Gohel/Pahadia/Vyas
L-7	Diseases affecting the structure of the bone imaging		50 minutes	Dr. Gohel/Pahadia/Vyas
L-8	Radiology of Malignant		50 minutes	Dr. Gohel/Pahadia/Vyas

	neoplasms			
L-9	Dental and Maxillofacial trauma imaging		50 minutes	Dr. Gohel/Pahadia/Vyas
L-10	Paranasal Sinus Disease imaging		50 minutes	Dr. Gohel/Pahadia/Vyas
L-11	Radiology of Craniofacial Anomalies		50 minutes	Dr. Gohel/Pahadia/Vyas
L-12	TMJ imaging		50 minutes	Dr. Gohel/Pahadia/Vyas
L-13	Soft Tissue Calcifications and Ossifications.		50 minutes	Dr. Gohel/Pahadia/Vyas
L-14	Salivary glands disease imaging		50 minutes	Dr. Gohel/Pahadia/Vyas
L-15	Forensic radiology		50 minutes	Dr. Gohel/Pahadia/Vyas
	Review		50 minutes	Dr. Gohel/Pahadia/Vyas

# PROPOSAL

## *DEN7762L: Clinical Radiology 1*

*Summer 2023*

### Course Description:

The student will expose, mount, and critique radiographic surveys for assigned patients; develop appropriate judgment and reasoning to declare a radiograph clinically acceptable as outlined by “criteria of radiographic acceptability”; and demonstrate proper radiation hygiene, infection control techniques, and appropriate patient management.

### I. General Information

#### Course Director:

Rutvi Vyas  
Office: D8-30  
Email: [rvyas@dental.ufl.edu](mailto:rvyas@dental.ufl.edu)  
Phone: (352) 273-6690  
Course Credits: .5  
Semester: Summer

#### Contributing Faculty

Anita Gohel (352) 273-6775 [AGohel@dental.ufl.edu](mailto:AGohel@dental.ufl.edu)  
Mayank Pahadia (352) 273-6692 [mayankpahadia@ufl.edu](mailto:mayankpahadia@ufl.edu)

#### Support Staff

Deborah Engstrom (352) 273-6775 [DEngstrom@dental.ufl.edu](mailto:DEngstrom@dental.ufl.edu) TA / Grade Administrator

Radiology residents

### II. Course Goals

The goal of the clinical radiology course is to contribute to the development of student competency in prescribing, performing, and interpreting a radiographic examination appropriate for the patient. As well as to enhance knowledge and be able to demonstrate expertise in normal anatomy; any observed abnormality(s) of the dentition, supporting structures, the temporomandibular joints, and the paranasal sinuses along with a differential diagnosis/impression when appropriate.

### III. Course Overview

This is a clinical radiology patient care rotation with written quizzes that must be completed each semester.

Students are to expose, mount, and critique radiographic surveys for assigned patients during screening/radiology rotations and for assigned comprehensive care patients needing radiographs through semester 9.

- The students will self-critique radiographic technique at the time of approving the images and grade themselves in the self-evaluation form in axiUm.
- The form will then be evaluated by the radiology faculty. All radiographs in Radiology must be approved by the radiology technicians.
- Additionally, students are to write via computer programs provided, a formal written interpretation of all assigned patient's radiographs, stating a preamble (quality of radiographs), findings, and conclusions. These are individually reviewed with radiology faculty.

Students will receive daily grades and complete written quizzes each semester to be awarded a course grade.

### IV. Course Outline

- Students attend Radiology Clinic (D1-85) by 8:00 a.m. or 2:00 p.m. on assigned days and complete at least 6 FMX series on assigned screening and/or comprehensive care patients.
- D3 students will do an interpretation session of panoramic radiographs and FMX series.
- D3 students expected to acquire at least 2 FMX or 35 periapical radiographs during your radiology rotation.
- Students will complete 3 Panoramic/FMX interpretation with the radiology residents during the fall (7) semester.
- Students must successfully pass the competency on Radiographic Technique and Interpretation by semester 8.
- Students must continue in the radiographic technique rotation through semester 9.

### V. Course Material

White and Pharoah's Oral Radiology – Principles and Interpretation, 8th Ed. ISBN: 032343839 (an e-version of 7th edition is also available at HSC dental library catalog.  
UFCD Criteria of Radiographic Acceptability (See Document Section)

Optional resource:

[HSC Dental Library Guide](#)

## VI. Course Objectives

### Professional Behavior:

1. Demonstrate professional behaviors and attitudes expected of a dentist.
2. Demonstrate cultural sensitivity during interactions with patients, families, providers, and staff.
3. Demonstrate ethical and legal behaviors essential to the practice of dentistry.
4. Identifying when a referral is indicated.

### Knowledge:

1. Recognize normal radiologic anatomy
2. Provide evidence-based patient care through the application of findings from the scientific and clinical literature.
3. Follow ADA/FDA Guidelines for prescription of radiographs.

### Skills:

1. Prescribe appropriate films specific to the patient and providers diagnostic needs.
2. Set or confirm technique factors (mA, time, kVp), distance (inverse square law), filtration, and collimation on the x-ray beam for the image.
3. Perform the exposure, scanning, and mounting of digital images using proper sterilization/disinfection and barrier protection techniques.
4. Produce a clinically acceptable digital image as defined by the "Criteria of Radiographic Acceptability" handout (In Canvas document section) and as summarized below:
  - Proper image density and contrast
  - Appropriate teeth and supporting bone demonstrate
  - No overlapping of interproximal spaces
  - Anatomically accurate images
  - Apices of all examined teeth on images or on at least one film of a radiographic series
  - No digital technique errors that affect diagnostic quality.
5. Arrange radiographic image(s) in the appropriate template.
6. Identify normal and abnormal anatomic structures on radiographic images.
7. Compare previous radiographs in order to evaluate disease progression.
8. Document differential diagnosis or radiologic impression of findings.
9. Complete a radiographic technique and interpretation assessment integrating the above objectives.

## VII. Course Competencies

This course teaches the following competencies in the "Competencies for the New Dental Graduate".

- 1: Critical Thinking: Use critical thinking and problem-solving, including their use in the comprehensive care of patients, scientific inquiry and research methodology
- 2: Evidence-Based Patient Care: Access, critically appraise, apply and communicate scientific and lay literature as it relates to providing evidence-based patient care.
- 3: Apply biomedical science knowledge in the delivery of patient care.
- 4: Ethical Standards: Apply principles of ethical decision making and professional responsibility.
- 5: Legal Standards: Apply legal and regulatory concepts related to the provision and/or support of oral health care services.
- 6: Appropriate Referral Provide oral health care within the scope of general dentistry to include recognizing the complexity of patient treatment and identifying when a referral is indicated.
- 12: Patient Assessment, Diagnosis, Treatment Planning and Informed Consent: Provide oral health care within the scope of general dentistry to include patient assessment, diagnosis, comprehensive treatment planning, prognosis, and informed consent.
- 26: Provide oral health care within the scope of general dentistry to include screening and risk assessment for head and neck cancer.

## VIII. Evaluation

### Daily Grading

Students will perform intra & extraoral radiographic procedures through semester 9. Each student must have a minimum of one radiology rotation each semester for a course grade to be issued.

### Grading Criteria: Radiographic Technique

- 4= \*Completed patient images (both extraoral and/or intraoral with NO retakes and:
- (a). Demonstrated proper patient management and treatment during the procedure at all times.
  - (b). Student demonstrated proper radiation hygiene for himself/herself and his/her patient (lead aprons if requested) at all times.
  - (c). Demonstrated proper barrier technique at all times in the clinic and "dim room" (digital) as outlined in the clinic manual "Infection Control Policy."  
(Improper barrier technique will result in automatic failure for that case.)
  - (d). Demonstrated proper judgment and reasoning to declare an image clinically acceptable even though not "ideal" as outlined in "Criteria of Radiographic Acceptability.
  - (e). Answered all related questions on technique and normal radiographic anatomy that was asked by faculty.

- 3= \*Completed patient images with minimal retakes [2 images for FMS] but was able to recognize the need for retake(s) and successfully identified error type(s).  
 \*Completed retakes successfully without assistance.  
 \*Satisfied (a), (b), (c) above.  
 \*Was able to answer all questions(e).
- 2= \*Completed patient images with minimal retakes (less than 10%) but failed to recognize need for retake(s) or could not determine error type(s).  
 \*Completed retakes without assistance.  
 \*Satisfied (a), (b), (c) above.  
 \*Was able to answer most questions (e).
- 1= The student will get a failing grade if any or all of the following critical errors are present  
 \*Completed patient images with greater than 10% retake rate. Did not recognize the need for retake(s) or could not determine error(s).  
 \*Needed assistance for retakes that were not recognized and/or result(s) lead to additional retake(s).  
 \*Did not satisfy (a) or (b) above and/or could not answer any questions posed concerning technique and/or anatomy.  
 \*Did not complete patient images or obtained a large number of retakes due to gross errors in judgment, technique, or patient management.  
 \*Did not maintain proper infection control barrier techniques (c).  
 \*Determined that student was ill-prepared to attend rotation.

## Grading Criteria: Radiographic Interpretation

- 4= (a) Completed the radiologic interpretation/consultation on all baseline radiographic surveys in your patient pool.  
 (b) Images were properly arranged.  
 (c) Demonstrated thorough knowledge of radiographic normal anatomy.  
 (d) Described all findings for maxillary sinuses, jaws, and teeth as requested in Undergraduate Interp Form.  
 (e) Described, when appropriate, the size, shape, borders, and relative radiodensity of all lesions.  
 (f) Described all abnormalities of dentition including tooth number(s), surface(s), and/or quadrants.  
 (g) When appropriate, provided differential diagnoses and was able to provide an explanation when asked.
- 3= \*Demonstrated a thorough knowledge of normal radiologic anatomy.  
 \*Interpretation needed minimal modification of findings, descriptions(s) or differentials(s) as described above in (d), (e), (f), and (g).  
 \*Was able to provide MOST explanations(s) when asked about differential diagnoses.  
 \*Satisfied (a) and (b) above.

- 2= \*Demonstrated a basic knowledge of normal radiologic anatomy.  
\*Interpretation needed moderate modification of findings, descriptions(s) or differentials(s) as described above in (d), (e), (f), and (g).
- 1= The student will get a failing grade if any or all of the following critical errors are present  
\*Interpretation needed a great deal of modification.  
\*Did not provide a differential diagnosis or was unable to provide adequate explanations when asked about differential diagnosis.
- \*Failed to satisfy (b) above.  
\*Demonstrated little knowledge of normal radiologic anatomy.  
\*Failed to recognize or describe adequately radiologic findings on images.

After the student "writes-up" the interpretation on the Undergraduate Interpretation Form, the student will review it with the radiology resident/faculty on a one-to-one basis. A grade will be given in Axium.

## Grade Weights:

- Daily Radiographic technique & Interpretation=50% (minimum of 1 each semester)
- Semester quiz in Canvas by due date=50%

## Competency Assessment:

Students must complete a minimum of 5 FMS (min of 10 radiographs) and 5 Radiographic Interpretations of FMS or FMS/Pan prior to be eligible to challenge the competency assessment.

Competency Grading is Pass/Fail.

Fail= Critical errors as mentioned above for technique and/or interpretation sections. The student must pass the Competency assessment by March 1 in Semester 8.

## Course Remediation:

Students that receive an "E" grade in the course must meet with the Course Director within a week from grades being posted and complete additional technique assignments.

## IX. Administrative Practices

Administrative practices for all UFCD courses are universally applied. Exceptions to or deviations from these practices are stated in the individual syllabi by the course director. When not individually stated in the syllabus, course administrative practices default to those identified under "Course Policies" on the DMD Student Website:

<https://dental.ufl.edu/education/dmd-program/course-policies/>

# X. Grade Scale

Method Letter Grade

Scale A-C, E

Tolerance 0 (Final letter grades within this range will be rounded up.)

A 100% to 90%

B <90% to 80%

C <80% to 72%

E <72%



# PROPOSAL

## *DEN7763L: Clinical Radiology 2*

*Fall 2023*

### Course Description:

The student will expose, mount, and critique radiographic surveys for assigned patients; develop appropriate judgment and reasoning to declare a radiograph clinically acceptable as outlined by “criteria of radiographic acceptability”; and demonstrate proper radiation hygiene, infection control techniques, and appropriate patient management.

### I. General Information

#### Course Director:

Rutvi Vyas  
Office: D8-30  
Email: [rvyas@dental.ufl.edu](mailto:rvyas@dental.ufl.edu)  
Phone: (352) 273-6690  
Course Credits: .5  
Semester: Fall

#### Contributing Faculty

Anita Gohel (352) 273-6775 [AGohel@dental.ufl.edu](mailto:AGohel@dental.ufl.edu)  
Mayank Pahadia (352) 273-6692 [mayankpahadia@ufl.edu](mailto:mayankpahadia@ufl.edu)

#### Support Staff

Deborah Engstrom (352) 273-6775 [DEngstrom@dental.ufl.edu](mailto:DEngstrom@dental.ufl.edu) TA / Grade Administrator

Radiology residents

### II. Course Goals

The goal of the clinical radiology course is to contribute to the development of student competency in prescribing, performing, and interpreting a radiographic examination appropriate for the patient. As well as to enhance knowledge and be able to demonstrate expertise in normal anatomy; any observed abnormality(s) of the dentition, supporting structures, the temporomandibular joints, and the paranasal sinuses along with a differential diagnosis/impression when appropriate.

### III. Course Overview

This is a clinical radiology patient care rotation with written quizzes that must be completed each semester.

Students are to expose, mount, and critique radiographic surveys for assigned patients during screening/radiology rotations and for assigned comprehensive care patients needing radiographs through semester 9.

- The students will self-critique radiographic technique at the time of approving the images and grade themselves in the self-evaluation form in axiUm.
- The form will then be evaluated by the radiology faculty. All radiographs in Radiology must be approved by the radiology technicians.
- Additionally, students are to write via computer programs provided, a formal written interpretation of all assigned patient's radiographs, stating a preamble (quality of radiographs), findings, and conclusions. These are individually reviewed with radiology faculty.

Students will receive daily grades and complete written quizzes each semester to be awarded a course grade.

### IV. Course Outline

- Students attend Radiology Clinic (D1-85) by 8:00 a.m. or 2:00 p.m. on assigned days and complete at least 6 FMX series on assigned screening and/or comprehensive care patients.
- D3 students will do an interpretation session of panoramic radiographs and FMX series.
- D3 students expected to acquire at least 2 FMX or 35 periapical radiographs during your radiology rotation.
- Students will complete 3 Panoramic/FMX interpretation with the radiology residents during the fall (7) semester.
- Students must successfully pass the competency on Radiographic Technique and Interpretation by semester 8.
- Students must continue in the radiographic technique rotation through semester 9.

### V. Course Material

White and Pharoah's Oral Radiology – Principles and Interpretation, 8th Ed. ISBN: 032343839  
(an e-version of 7th edition is also available at HSC dental library catalog.  
UFCD Criteria of Radiographic Acceptability (See Document Section)

Optional resource:

[HSC Dental Library Guide](#)

## VI. Course Objectives

### Professional Behavior:

1. Demonstrate professional behaviors and attitudes expected of a dentist.
2. Demonstrate cultural sensitivity during interactions with patients, families, providers, and staff.
3. Demonstrate ethical and legal behaviors essential to the practice of dentistry.
4. Identifying when a referral is indicated.

### Knowledge:

1. Recognize normal radiologic anatomy
2. Provide evidence-based patient care through the application of findings from the scientific and clinical literature.
3. Follow ADA/FDA Guidelines for prescription of radiographs.

### Skills:

1. Prescribe appropriate films specific to the patient and providers diagnostic needs.
2. Set or confirm technique factors (mA, time, kVp), distance (inverse square law), filtration, and collimation on the x-ray beam for the image.
3. Perform the exposure, scanning, and mounting of digital images using proper sterilization/disinfection and barrier protection techniques.
4. Produce a clinically acceptable digital image as defined by the "Criteria of Radiographic Acceptability" handout (In Canvas document section) and as summarized below:
  - Proper image density and contrast
  - Appropriate teeth and supporting bone demonstrate
  - No overlapping of interproximal spaces
  - Anatomically accurate images
  - Apices of all examined teeth on images or on at least one film of a radiographic series
  - No digital technique errors that affect diagnostic quality.
5. Arrange radiographic image(s) in the appropriate template.
6. Identify normal and abnormal anatomic structures on radiographic images.
7. Compare previous radiographs in order to evaluate disease progression.
8. Document differential diagnosis or radiologic impression of findings.
9. Complete a radiographic technique and interpretation assessment integrating the above objectives.

## VII. Course Competencies

This course teaches the following competencies in the "Competencies for the New Dental Graduate".

- 1: Critical Thinking: Use critical thinking and problem-solving, including their use in the comprehensive care of patients, scientific inquiry and research methodology
- 2: Evidence-Based Patient Care: Access, critically appraise, apply and communicate scientific and lay literature as it relates to providing evidence-based patient care.
- 3: Apply biomedical science knowledge in the delivery of patient care.
- 4: Ethical Standards: Apply principles of ethical decision making and professional responsibility.
- 5: Legal Standards: Apply legal and regulatory concepts related to the provision and/or support of oral health care services.
- 6: Appropriate Referral Provide oral health care within the scope of general dentistry to include recognizing the complexity of patient treatment and identifying when a referral is indicated.
- 12: Patient Assessment, Diagnosis, Treatment Planning and Informed Consent: Provide oral health care within the scope of general dentistry to include patient assessment, diagnosis, comprehensive treatment planning, prognosis, and informed consent.
- 26: Provide oral health care within the scope of general dentistry to include screening and risk assessment for head and neck cancer.

## VIII. Evaluation

### Daily Grading

Students will perform intra & extraoral radiographic procedures through semester 9. Each student must have a minimum of one radiology rotation each semester for a course grade to be issued.

### Grading Criteria: Radiographic Technique

- 4= \*Completed patient images (both extraoral and/or intraoral with NO retakes and:
- (a). Demonstrated proper patient management and treatment during the procedure at all times.
  - (b). Student demonstrated proper radiation hygiene for himself/herself and his/her patient (lead aprons if requested) at all times.
  - (c). Demonstrated proper barrier technique at all times in the clinic and "dim room" (digital) as outlined in the clinic manual "Infection Control Policy."  
(Improper barrier technique will result in automatic failure for that case.)
  - (d). Demonstrated proper judgment and reasoning to declare an image clinically acceptable even though not "ideal" as outlined in "Criteria of Radiographic Acceptability.
  - (e). Answered all related questions on technique and normal radiographic anatomy that was asked by faculty.

- 3= \*Completed patient images with minimal retakes [2 images for FMS] but was able to recognize the need for retake(s) and successfully identified error type(s).  
 \*Completed retakes successfully without assistance.  
 \*Satisfied (a), (b), (c) above.  
 \*Was able to answer all questions(e).
- 2= \*Completed patient images with minimal retakes (less than 10%) but failed to recognize need for retake(s) or could not determine error type(s).  
 \*Completed retakes without assistance.  
 \*Satisfied (a), (b), (c) above.  
 \*Was able to answer most questions (e).
- 1= The student will get a failing grade if any or all of the following critical errors are present  
 \*Completed patient images with greater than 10% retake rate. Did not recognize the need for retake(s) or could not determine error(s).  
 \*Needed assistance for retakes that were not recognized and/or result(s) lead to additional retake(s).  
 \*Did not satisfy (a) or (b) above and/or could not answer any questions posed concerning technique and/or anatomy.  
 \*Did not complete patient images or obtained a large number of retakes due to gross errors in judgment, technique, or patient management.  
 \*Did not maintain proper infection control barrier techniques (c).  
 \*Determined that student was ill-prepared to attend rotation.

## Grading Criteria: Radiographic Interpretation

- 4= (a) Completed the radiologic interpretation/consultation on all baseline radiographic surveys in your patient pool.  
 (b) Images were properly arranged.  
 (c) Demonstrated thorough knowledge of radiographic normal anatomy.  
 (d) Described all findings for maxillary sinuses, jaws, and teeth as requested in Undergraduate Interp Form.  
 (e) Described, when appropriate, the size, shape, borders, and relative radiodensity of all lesions.  
 (f) Described all abnormalities of dentition including tooth number(s), surface(s), and/or quadrants.  
 (g) When appropriate, provided differential diagnoses and was able to provide an explanation when asked.
- 3= \*Demonstrated a thorough knowledge of normal radiologic anatomy.  
 \*Interpretation needed minimal modification of findings, descriptions(s) or differentials(s) as described above in (d), (e), (f), and (g).  
 \*Was able to provide MOST explanations(s) when asked about differential diagnoses.  
 \*Satisfied (a) and (b) above.

- 2= \*Demonstrated a basic knowledge of normal radiologic anatomy.  
\*Interpretation needed moderate modification of findings, descriptions(s) or differentials(s) as described above in (d), (e), (f), and (g).
- 1= The student will get a failing grade if any or all of the following critical errors are present  
\*Interpretation needed a great deal of modification.  
\*Did not provide a differential diagnosis or was unable to provide adequate explanations when asked about differential diagnosis.
- \*Failed to satisfy (b) above.  
\*Demonstrated little knowledge of normal radiologic anatomy.  
\*Failed to recognize or describe adequately radiologic findings on images.

After the student "writes-up" the interpretation on the Undergraduate Interpretation Form, the student will review it with the radiology resident/faculty on a one-to-one basis. A grade will be given in Axium.

## Grade Weights:

- Daily Radiographic technique & Interpretation=50% (minimum of 1 each semester)
- Semester quiz in Canvas by due date=50%

## Competency Assessment:

Students must complete a minimum of 5 FMS (min of 10 radiographs) and 5 Radiographic Interpretations of FMS or FMS/Pan prior to be eligible to challenge the competency assessment.

Competency Grading is Pass/Fail.

Fail= Critical errors as mentioned above for technique and/or interpretation sections. The student must pass the Competency assessment by March 1 in Semester 8.

## Course Remediation:

Students that receive an "E" grade in the course must meet with the Course Director within a week from grades being posted and complete additional technique assignments.

## IX. Administrative Practices

Administrative practices for all UFCD courses are universally applied. Exceptions to or deviations from these practices are stated in the individual syllabi by the course director. When not individually stated in the syllabus, course administrative practices default to those identified under "Course Policies" on the DMD Student Website:

<https://dental.ufl.edu/education/dmd-program/course-policies/>

# X. Grade Scale

Method Letter Grade

Scale A-C, E

Tolerance 0 (Final letter grades within this range will be rounded up.)

A 100% to 90%

B <90% to 80%

C <80% to 72%

E <72%

# PROPOSAL

## *DEN7764L: Clinical Radiology 3*

*Spring 2023*

### Course Description:

The student will expose, mount, and critique radiographic surveys for assigned patients; develop appropriate judgment and reasoning to declare a radiograph clinically acceptable as outlined by “criteria of radiographic acceptability”; and demonstrate proper radiation hygiene, infection control techniques, and appropriate patient management.

### I. General Information

#### Course Director:

Rutvi Vyas  
Office: D8-30  
Email: [rvyas@dental.ufl.edu](mailto:rvyas@dental.ufl.edu)  
Phone: (352) 273-6690  
Course Credits: .5  
Semester: Spring

#### Contributing Faculty

Anita Gohel (352) 273-6775 [AGohel@dental.ufl.edu](mailto:AGohel@dental.ufl.edu)  
Mayank Pahadia (352) 273-6692 [mayankpahadia@ufl.edu](mailto:mayankpahadia@ufl.edu)

#### Support Staff

Deborah Engstrom (352) 273-6775 [DEngstrom@dental.ufl.edu](mailto:DEngstrom@dental.ufl.edu) TA / Grade Administrator

Radiology residents

### II. Course Goals

The goal of the clinical radiology course is to contribute to the development of student competency in prescribing, performing, and interpreting a radiographic examination appropriate for the patient. As well as to enhance knowledge and be able to demonstrate expertise in normal anatomy; any observed abnormality(s) of the dentition, supporting structures, the temporomandibular joints, and the paranasal sinuses along with a differential diagnosis/impression when appropriate.

### III. Course Overview

This is a clinical radiology patient care rotation with written quizzes that must be completed each semester.

Students are to expose, mount, and critique radiographic surveys for assigned patients during screening/radiology rotations and for assigned comprehensive care patients needing radiographs through semester 9.

- The students will self-critique radiographic technique at the time of approving the images and grade themselves in the self-evaluation form in axiUm.
- The form will then be evaluated by the radiology faculty. All radiographs in Radiology must be approved by the radiology technicians.
- Additionally, students are to write via computer programs provided, a formal written interpretation of all assigned patient's radiographs, stating a preamble (quality of radiographs), findings, and conclusions. These are individually reviewed with radiology faculty.

Students will receive daily grades and complete written quizzes each semester to be awarded a course grade.

### IV. Course Outline

- Students attend Radiology Clinic (D1-85) by 8:00 a.m. or 2:00 p.m. on assigned days and complete at least 6 FMX series on assigned screening and/or comprehensive care patients.
- D3 students will do an interpretation session of panoramic radiographs and FMX series.
- D3 students expected to acquire at least 2 FMX or 35 periapical radiographs during your radiology rotation.
- Students will complete 3 Panoramic/FMX interpretation with the radiology residents during the fall (7) semester.
- Students must successfully pass the competency on Radiographic Technique and Interpretation by semester 8.
- Students must continue in the radiographic technique rotation through semester 9.

### V. Course Material

White and Pharoah's Oral Radiology – Principles and Interpretation, 8th Ed. ISBN: 032343839  
(an e-version of 7th edition is also available at HSC dental library catalog.  
UFCD Criteria of Radiographic Acceptability (See Document Section)

Optional resource:

[HSC Dental Library Guide](#)

# VI. Course Objectives

## Professional Behavior:

1. Demonstrate professional behaviors and attitudes expected of a dentist.
2. Demonstrate cultural sensitivity during interactions with patients, families, providers, and staff.
3. Demonstrate ethical and legal behaviors essential to the practice of dentistry.
4. Identifying when a referral is indicated.

## Knowledge:

1. Recognize normal radiologic anatomy
2. Provide evidence-based patient care through the application of findings from the scientific and clinical literature.
3. Follow ADA/FDA Guidelines for prescription of radiographs.

## Skills:

1. Set or confirm technique factors (mA, time, kVp), distance (inverse square law), filtration, and collimation on the x-ray beam for the image.
2. Perform the exposure, scanning, and mounting of digital images using proper sterilization/disinfection and barrier protection techniques.
3. Produce a clinically acceptable digital image as defined by the "Criteria of Radiographic Acceptability" handout (In Canvas document section) and as summarized below:
4. Proper image density and contrast
5. Appropriate teeth and supporting bone demonstrate
6. No overlapping of interproximal spaces
7. Anatomically accurate images
8. Apices of all examined teeth on images or on at least one film of a radiographic series
9. No digital technique errors that affect diagnostic quality.
10. Arrange radiographic image(s) in the appropriate template.
11. Identify normal and abnormal anatomic structures on radiographic images.
12. Compare previous radiographs in order to evaluate disease progression.
13. Document differential diagnosis or radiologic impression of findings.
14. Complete a radiographic technique and interpretation assessment integrating the above objectives.
15. Prescribe appropriate films specific to the patient and providers diagnostic needs.

## VII. Course Competencies

This course teaches the following competencies in the "Competencies for the New Dental Graduate".

- 1: Critical Thinking: Use critical thinking and problem-solving, including their use in the comprehensive care of patients, scientific inquiry and research methodology
- 2: Evidence-Based Patient Care: Access, critically appraise, apply and communicate scientific and lay literature as it relates to providing evidence-based patient care.
- 3: Apply biomedical science knowledge in the delivery of patient care.
- 4: Ethical Standards: Apply principles of ethical decision making and professional responsibility.
- 5: Legal Standards: Apply legal and regulatory concepts related to the provision and/or support of oral health care services.
- 6: Appropriate Referral Provide oral health care within the scope of general dentistry to include recognizing the complexity of patient treatment and identifying when a referral is indicated.
- 12: Patient Assessment, Diagnosis, Treatment Planning and Informed Consent: Provide oral health care within the scope of general dentistry to include patient assessment, diagnosis, comprehensive treatment planning, prognosis, and informed consent.
- 26: Provide oral health care within the scope of general dentistry to include screening and risk assessment for head and neck cancer.

This course assesses the following competencies in the "Competencies for the New Dental Graduate".

- 26: Provide oral health care within the scope of general dentistry to include screening and risk assessment for head and neck cancer.

## VIII. Evaluation

### Daily Grading

Students will perform intra & extraoral radiographic procedures through semester 9. Each student must have a minimum of one radiology rotation each semester for a course grade to be issued.

### Grading Criteria: Radiographic Technique

- 4= \*Completed patient images (both extraoral and/or intraoral with NO retakes and:
- (a). Demonstrated proper patient management and treatment during the procedure at all times.
  - (b). Student demonstrated proper radiation hygiene for himself/herself and his/her patient (lead aprons if requested) at all times.
  - (c). Demonstrated proper barrier technique at all times in the clinic and "dim room" (digital) as outlined in the clinic manual "Infection Control Policy."  
(Improper barrier technique will result in automatic failure for that case.)
  - (d). Demonstrated proper judgment and reasoning to declare an image clinically acceptable even though not "ideal" as outlined in "Criteria of Radiographic Acceptability.
  - (e). Answered all related questions on technique and normal radiographic anatomy that was asked by faculty.

- 3= \*Completed patient images with minimal retakes [2 images for FMS] but was able to recognize the need for retake(s) and successfully identified error type(s).  
 \*Completed retakes successfully without assistance.  
 \*Satisfied (a), (b), (c) above.  
 \*Was able to answer all questions(e).
- 2= \*Completed patient images with minimal retakes (less than 10%) but failed to recognize need for retake(s) or could not determine error type(s).  
 \*Completed retakes without assistance.  
 \*Satisfied (a), (b), (c) above.  
 \*Was able to answer most questions (e).
- 1= The student will get a failing grade if any or all of the following critical errors are present  
 \*Completed patient images with greater than 10% retake rate. Did not recognize the need for retake(s) or could not determine error(s).  
 \*Needed assistance for retakes that were not recognized and/or result(s) lead to additional retake(s).  
 \*Did not satisfy (a) or (b) above and/or could not answer any questions posed concerning technique and/or anatomy.  
 \*Did not complete patient images or obtained a large number of retakes due to gross errors in judgment, technique, or patient management.  
 \*Did not maintain proper infection control barrier techniques (c).  
 \*Determined that student was ill-prepared to attend rotation.

## Grading Criteria: Radiographic Interpretation

- 4= (a) Completed the radiologic interpretation/consultation on all baseline radiographic surveys in your patient pool.  
 (b) Images were properly arranged.  
 (c) Demonstrated thorough knowledge of radiographic normal anatomy.  
 (d) Described all findings for maxillary sinuses, jaws, and teeth as requested in Undergraduate Interp Form.  
 (e) Described, when appropriate, the size, shape, borders, and relative radiodensity of all lesions.  
 (f) Described all abnormalities of dentition including tooth number(s), surface(s), and/or quadrants.  
 (g) When appropriate, provided differential diagnoses and was able to provide an explanation when asked.
- 3= \*Demonstrated a thorough knowledge of normal radiologic anatomy.  
 \*Interpretation needed minimal modification of findings, descriptions(s) or differentials(s) as described above in (d), (e), (f), and (g).  
 \*Was able to provide MOST explanations(s) when asked about differential diagnoses.  
 \*Satisfied (a) and (b) above.
- 2= \*Demonstrated a basic knowledge of normal radiologic anatomy.  
 \*Interpretation needed moderate modification of findings, descriptions(s) or differentials(s) as described above in (d), (e), (f), and (g).

- 1= The student will get a failing grade if any or all of the following critical errors are present
- \*Interpretation needed a great deal of modification.
  - \*Did not provide a differential diagnosis or was unable to provide adequate explanations when asked about differential diagnosis.
- 
- \*Failed to satisfy (b) above.
  - \*Demonstrated little knowledge of normal radiologic anatomy.
  - \*Failed to recognize or describe adequately radiologic findings on images.

After the student "writes-up" the interpretation on the Undergraduate Interpretation Form, the student will review it with the radiology resident/faculty on a one-to-one basis. A grade will be given in Axium.

## Grade Weights:

- Daily Radiographic technique & Interpretation=50% (minimum of 1 each semester)
- Semester quiz in Canvas by due date=50%

## Competency Assessment:

Students must complete a minimum of 5 FMS (min of 10 radiographs) and 5 Radiographic Interpretations of FMS or FMS/Pan prior to be eligible to challenge the competency assessment.

Competency Grading is Pass/Fail.

Fail= Critical errors as mentioned above for technique and/or interpretation sections. The student must pass the Competency assessment by March 1 in Semester 8.

## Course Remediation:

Students that receive an "E" grade in the course must meet with the Course Director within a week from grades being posted and complete additional technique assignments.

Competency Remediation: Students that do not successfully complete the Radiology Technique and Interpretation Competency Assessment must remediate this assessment by selecting and taking radiographs on another patient until it can be performed at a satisfactory level without assistance. Remediation of course must be completed no later than 2 weeks from the date of final grades posted. The student will not pass the course until the competency assessment is successfully passed.

## IX. Administrative Practices

Administrative practices for all UFCD courses are universally applied. Exceptions to or deviations from these practices are stated in the individual syllabi by the course director. When not individually stated in the syllabus, course administrative practices default to those identified under "Course Policies" on the DMD Student Website:

<https://dental.ufl.edu/education/dmd-program/course-policies/>

# X. Grade Scale

Method Letter Grade

Scale A-C, E

Tolerance 0 (Final letter grades within this range will be rounded up.)

A 100% to 90%

B <90% to 80%

C <80% to 72%

E <72%

# PROPOSAL

## *DEN8765L: Clinical Radiology 4*

*Summer 2024*

### Course Description:

The student will expose, mount, and critique radiographic surveys for assigned patients; develop appropriate judgment and reasoning to declare a radiograph clinically acceptable as outlined by “criteria of radiographic acceptability”; and demonstrate proper radiation hygiene, infection control techniques, and appropriate patient management.

## I. General Information

### Course Director:

Rutvi Vyas  
Office: D8-30  
Email: [rvyas@dental.ufl.edu](mailto:rvyas@dental.ufl.edu)  
Phone: (352) 273-6690  
Course Credits: .5  
Semester: Summer

### Contributing Faculty

Anita Gohel (352) 273-6775 [AGohel@dental.ufl.edu](mailto:AGohel@dental.ufl.edu)  
Mayank Pahadia (352) 273-6692 [mayankpahadia@ufl.edu](mailto:mayankpahadia@ufl.edu)

### Support Staff

Deborah Engstrom (352) 273-6775 [DEngstrom@dental.ufl.edu](mailto:DEngstrom@dental.ufl.edu) TA / Grade Administrator

Radiology residents

## II. Course Goals

The goal of the clinical radiology course is to contribute to the development of student competency in prescribing, performing, and interpreting a radiographic examination appropriate for the patient. As well as to enhance knowledge and be able to demonstrate expertise in normal anatomy; any observed abnormality(s) of the dentition, supporting structures, the temporomandibular joints, and the paranasal sinuses along with a differential diagnosis/impression when appropriate

### III. Course Overview

This is a clinical radiology patient care rotation with written quizzes that must be completed each semester.

Students are to expose, mount, and critique radiographic surveys for assigned patients during screening/radiology rotations and for assigned comprehensive care patients needing radiographs through semester 9. Students to participate in learning and demonstrate competency in basic CBCT anatomy during hands-on CBCT session.

- The students will self-critique radiographic technique at the time of approving the images and grade themselves in the self-evaluation form in axiUm.
- The form will then be evaluated by the radiology faculty. All radiographs acquired in Radiology must be approved by the radiology technicians.
- Additionally, students are to write via computer programs provided, a formal written interpretation of all assigned patient's radiographs, stating a preamble (quality of radiographs), findings, and conclusions. These are individually reviewed with students one-on-one with radiology faculty.

Students will receive daily grades and complete written quizzes each semester to be awarded a course grade.

### IV. Course Outline

- Students attend Radiology Clinic (D1-85) by 8:00 a.m. or 2:00 p.m. on assigned days and complete at least 6 FMX series on assigned screening and/or comprehensive care patients.
- D4 students will do an interpretation session of panoramic radiographs and FMX series.
- D4 students expected to acquire at least 2 FMX or 35 periapical radiographs during your radiology rotation.
- Students must actively participate in learning CBCT cross sections, viewing 3D anatomy, and must be able to demonstrate competency in basic CBCT understanding during hands-on session.
- Students must continue in the radiographic technique rotation through semester 9.

### V. Course Material

White and Pharaoh's Oral Radiology – Principles and Interpretation, 8th Ed. ISBN: 032343839(an e-version of 7th edition is also available at HSC dental library catalog. UFCD Criteria of Radiographic Acceptability (See Document Section)

Optional resource:  
[HSC Dental Library Guide](#)

# VI. Course Objectives

## Professional Behavior:

1. Demonstrate professional behaviors and attitudes expected of a dentist.
2. Demonstrate cultural sensitivity during interactions with patients, families, providers, and staff.
3. Demonstrate ethical and legal behaviors essential to the practice of dentistry.
4. Identifying when a referral is indicated.

## Knowledge:

1. Recognize normal radiologic anatomy
2. Provide evidence-based patient care through the application of findings from the scientific and clinical literature.
3. Follow ADA/FDA Guidelines for prescription of radiographs.

## Skills:

1. Prescribe appropriate films specific to the patient and providers diagnostic needs.
2. Set or confirm technique factors (mA, time, kVp), distance (inverse square law), filtration, and collimation on the x-ray beam for the image.
3. Perform the exposure, scanning, and mounting of digital images using proper sterilization/disinfection and barrier protection techniques.
4. Produce a clinically acceptable digital image as defined by the "Criteria of Radiographic Acceptability" handout (In Canvas document section) and as summarized below:
  - Proper image density and contrast
  - Appropriate teeth and supporting bone demonstrate
  - No overlapping of interproximal spaces
  - Anatomically accurate images
  - Apices of all examined teeth on images or on at least one film of a radiographic series
  - No digital technique errors that affect diagnostic quality.
5. Arrange radiographic image(s) in the appropriate template.
6. Identify normal and abnormal anatomic structures on radiographic images.
7. Compare previous radiographs in order to evaluate disease progression.
8. Document differential diagnosis or radiologic impression of findings.
9. Complete a radiographic technique and interpretation assessment integrating the above objectives.

## VII. Course Competencies

This course teaches the following competencies in the "Competencies for the New Dental Graduate".

- 1: Critical Thinking: Use critical thinking and problem-solving, including their use in the comprehensive care of patients, scientific inquiry and research methodology.
- 2: Evidence-Based Patient Care: Access, critically appraise, apply and communicate scientific and lay literature as it relates to providing evidence-based patient care.
- 3: Apply biomedical science knowledge in the delivery of patient care.
- 4: Ethical Standards: Apply principles of ethical decision making and professional responsibility.
- 5: Legal Standards: Apply legal and regulatory concepts related to the provision and/or support of oral health care services.
- 6: Appropriate Referral Provide oral health care within the scope of general dentistry to include recognizing the complexity of patient treatment and identifying when a referral is indicated.
- 12: Patient Assessment, Diagnosis, Treatment Planning and Informed Consent: Provide oral health care within the scope of general dentistry to include patient assessment, diagnosis, comprehensive treatment planning, prognosis, and informed consent.
- 26: Provide oral health care within the scope of general dentistry to include screening and risk assessment for head and neck cancer.

## VIII. Evaluation

### Daily Grading

Students will perform intra & extraoral radiographic procedures through semester 9. Each student must have a minimum of one radiology rotation each semester for a course grade to be issued.

### Grading Criteria: Radiographic Technique

- 4= \*Completed patient images (both extraoral and/or intraoral with NO retakes and:
- (a). Demonstrated proper patient management and treatment during the procedure at all times.
  - (b). Student demonstrated proper radiation hygiene for himself/herself and his/her patient (lead aprons if requested) at all times.
  - (c). Demonstrated proper barrier technique at all times in the clinic and "dim room" (digital) as outlined in the clinic manual "Infection Control Policy."  
(Improper barrier technique will result in automatic failure for that case.)
  - (d). Demonstrated proper judgment and reasoning to declare an image clinically acceptable even though not "ideal" as outlined in "Criteria of Radiographic Acceptability.
  - (e). Answered all related questions on technique and normal radiographic anatomy that was asked by faculty.

- 3= \*Completed patient images with minimal retakes [2 images for FMS] but was able to recognize the need for retake(s) and successfully identified error type(s).  
 \*Completed retakes successfully without assistance.  
 \*Satisfied (a), (b), (c) above.  
 \*Was able to answer all questions(e).
- 2= \*Completed patient images with minimal retakes (less than 10%) but failed to recognize need for retake(s) or could not determine error type(s).  
 \*Completed retakes without assistance.  
 \*Satisfied (a), (b), (c) above.  
 \*Was able to answer most questions (e).
- 1= The student will get a failing grade if any or all of the following critical errors are present  
 \*Completed patient images with greater than 10% retake rate. Did not recognize the need for retake(s) or could not determine error(s).  
 \*Needed assistance for retakes that were not recognized and/or result(s) lead to additional retake(s).  
 \*Did not satisfy (a) or (b) above and/or could not answer any questions posed concerning technique and/or anatomy.  
 \*Did not complete patient images or obtained a large number of retakes due to gross errors in judgment, technique, or patient management.  
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- 3= \*Demonstrated a thorough knowledge of normal radiologic anatomy.  
 \*Interpretation needed minimal modification of findings, descriptions(s) or differentials(s) as described above in (d), (e), (f), and (g).  
 \*Was able to provide MOST explanations(s) when asked about differential diagnoses.  
 \*Satisfied (a) and (b) above.

- 2= \*Demonstrated a basic knowledge of normal radiologic anatomy.  
\*Interpretation needed moderate modification of findings, descriptions(s) or differentials(s) as described above in (d), (e), (f), and (g).
- 1= The student will get a failing grade if any or all of the following critical errors are present  
\*Interpretation needed a great deal of modification.  
\*Did not provide a differential diagnosis or was unable to provide adequate explanations when asked about differential diagnosis.  
\*Failed to satisfy (b) above.  
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After the student "writes-up" the interpretation on the Undergraduate Interpretation Form, the student will review it with the radiology resident/faculty on a one-to-one basis. A grade will be given in Axium.

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Method Letter GradeScale

A-C, E

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C <80% to 72%

E <72%





