

**Purpose:** It is the intention of this Administrative-Master Syllabus to provide a general description of the course, outline the required elements of the course and to lay the foundation for course assessment for the improvement of student learning, as specified by the faculty of Wharton County Junior College, regardless of who teaches the course, the timeframe by which it is instructed, or the instructional method by which the course is delivered. It is not intended to restrict the manner by which an individual faculty member teaches the course but to be an administrative tool to aid in the improvement of instruction.

**Course Title** – Dental Radiology

**Course Prefix and Number** – DHYG 1304

**Department** – Dental Hygiene

**Division** – Allied Health

**Course Type:** (check one)

- Academic General Education Course (from ACGM – but not in WCJC Core)  
 Academic WCJC Core Course  
 WECM course (This course is a Special Topics or Unique Needs Course: Y or N)

**Semester Credit Hours # : Lecture hours# : Lab/other hours #**     3:2:3





**Equated Pay hours for course** – 3.5

**Course Catalog Description** - : Radiation Physics, biology, hygiene and safety theories with an emphasis on the fundamentals of oral radiographic technique and interpretation of radiographs. Includes exposure of intra-oral radiographs, quality assurance, radiographic interpretation, patient selection criteria, and other ancillary radiographic techniques:

<b>List Lab/ Other Hours</b>
Lab Hours 3
Clinical Hours 0
Practicum Hours 0
Other (list) 0

**Prerequisites/Corequisites** - DHYG 1301,1311,1431 with a grade of C or better

**Approvals** – the contents of this document have been reviewed and are found to be accurate.

Prepared by Carol Derkowski	Signature 	Date 2-1-10
Department Head Carol Derkowski	Signature 	Date 2-1-10
Division Chair Carol Derkowski	Signature 	Date 2-1-10
Vice President of Instruction or Dean of Vocational Instruction	Signature 	Date 2-24-10



**I. Topical Outline** – Each offering of this course must include the following topics (be sure to include information regarding lab, practicum, clinical or other non lecture instruction):

- I. Properties of Radiation
  - A. Properties of electromagnetic radiation
  - B. Process of ionization
  
- II. X-ray Machine
  - A. X-ray generation
  - B. Regulating devices
    1. KVP control
    2. MA control
    3. Timer
  
- III. Filter and diaphragm
  - A. Function
  - B. Composition
  
- IV. Effect of Radiation on Body Tissue
  - A. Cell destruction
  - B. Sensitive tissue
  - C. Effect of exposure
  
- V. Protection
  - A. Patient protection
  - B. Operator protection
  
- VI. Radiation Measurement
  
- VII. Dental Film
  - A. Parts of film
  - B. Film speed
  - C. Emulsion contents
  
- VIII. Processing Procedures
  - A. Manual Processing
    1. Chemicals
    2. Time/temperature method of development
  - B. Automatic Processing
    1. Procedure
    2. Maintenance
  - C. Asepsis in the darkroom
  
- IX. Factors of Film Quality
  - A. Wave length
  - B. Effect of KVP and MA
  - C. Inverse Square Law
  - D. Manipulation of Film Quality Factors
  
- X. X-ray Recognition
  - A. Anatomical Landmarks
  - B. Pathology vs Normal Anatomy

- C. Radiograph Interpretation
- XI. Patient Management Techniques
- XII. Exposure and Processing Errors
  - A. Cause
  - B. Prevention
  - C. Recognition
- XIII. Intraoral Techniques
  - A. Paralleling
  - B. Bisection of Angle
- XIV. Special Patients
  - A. Pedodontic Patients
  - B. Edentulous Patients
- XV. Extraoral Techniques
  - A. Occlusal views
  - B. Extraoral views
  - C. Panoramic technique
- XVI. Quality Control Measures
- XVII. Digital Radiography

#### LAB OUTLINE

- I. Orientation
  - A. Equipment
    - 1. X-ray Machines
      - a. Assepsis
      - b. Maintanance
    - 2. Darkroom
      - a. Asepsis
      - b. Maintanace
    - 3. Radiation Protection
      - a. Operator
      - b. Patient
- II. Intraoral Radiographic Technique
  - A. Paralleling Technique
  - B. Criteria for Radiographic Evaluation
  - C. Interproximal Technique Demonstration
  - D. Practical Exercise - manikins
- III. Anatomical Landmarks
  - A. Slide Series
  - B. Identification of Landmarks
    - 1. Skull
    - 2. Radiographs
  - C. Recognition of Landmarks on Practice Sets
- IV. Intraoral Techniques
  - A. Maxillary Film Placement and Exposure Technique
  - B. Mandibular Film Placement and Exposure Technique
  - C. Bitewings with tabs
  - D. Vertical bitewings

- V. Practical Exercises
  - A. Mounting
  - B. Complete Film Series - Manikin
  - C. Landmark Identification
  
- VI. Panoramic Technique
  - A. Equipment
  - B. Patient position
  - C. Asepsis
  - D. Radiation safety

**II. Course Learning Outcomes**

Course Learning Outcome	Method of Assessment
1. Explain the theories of radiation physics, biology, hygiene and safety.	1. Written Exam
2. Describe the fundamentals of oral radiographic technique and radiographic interpretation.	2. Written Exam and lab exercises
3. Expose, process and interpret diagnostically acceptable radiographs utilizing various radiographic techniques.	3. Lab competencies
4. Apply the principles of quality assurance in dental radiography.	4. Lab competencies
5. Demonstrate appropriate patient and operator protection techniques.	5. Lab exercises

**III. Required Text(s), Optional Text(s) and/or Materials to be Supplied by Student.**

Haring, Joen I. and Laura J. Lind. Dental Radiography Principles and Techniques. W.B.Saunders, Third Edition, 2006.  
 Rinn XCP instrument

**IV. Suggested Course Maximum - 28**

**V. List any specific spatial or physical requirements beyond a typical classroom required to teach the course.**

Dxtrr x-ray manequin , darkroom, processing equipment, dental chair, x-ray machine, digital x-ray system and software, panoramic x-ray machine

**VI. Course Requirements/Grading System – Describe any course specific requirements such as research papers or reading assignments and the generalized grading format for the course**

Lab 50%	A=93-100
Lab Assignments	B=84-92
	C=83-75
Lecture 50%	D=74-67
Written exams, Quizzes, Final	F=66 & below
Minimum grade of 75 must be earned in lab and in lecture	

**VII. Curriculum Checklist**

- **Academic General Education Course** (from ACGM – but not in WCJC Core)  
No additional documentation needed
- **Academic WCJC Core Course**  
Attach the Core Curriculum Checklist, including the following:
- Basic Intellectual Competencies
  - Perspectives
  - Exemplary Educational Objectives
- **WECM Courses**  
Attach the following:
- Program SCANS Matrix
  - Course SCANS Competencies Checklist



Course Prefix & Number: DHYG 1304	
<b>SCANS COMPETENCIES FOR THIS COURSE</b>	
Competency	Method of Assessment
<b>1 READING:</b> Locate, understand, and interpret written information in prose and in documents such as manuals, graphs, and schedules.	Lab & written exams
<b>2 WRITING:</b> Communicate thoughts, ideas, information, and messages in writing, and create documents such as letters, directions, manuals, reports, graphs, and flow charts.	Lab exercises
<b>3 ARITHMETIC OR MATHEMATICS:</b> Perform basic computations and approach practical problems by choosing appropriately from a variety of mathematical techniques.	Written exam
<b>4 SPEAKING AND LISTENING:</b> Organize ideas and communicate orally; receive, attend to, interpret, and respond to verbal messages and other cues.	Lab exercises
<b>5 THINKING SKILLS:</b> A worker must think creatively, make decisions, solve problems, visualize, know how to learn, and reason effectively.	Lab & written exams
<b>6 PERSON QUALITIES:</b> A worker must display responsibility, self-esteem, sociability, self-management, integrity, and honesty.	Lab exercises
<b>7 WORKPLACE COMPETENCIES:</b> resources; interpersonal skills; information; systems; and technology	Lab experiences
<b>8 BASIC USE OF COMPUTERS</b>	Lab exercises

**SCANS Matrix**

Program: Dental Hygiene  
 CIP: 51.0602

**LIST ALL COURSES REQUIRED AND IDENTIFIED COMPETENCIES**

Competencies								Course Number	Course Title
1	2	3	4	5	6	7	8		
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	BIOL 2401	Anatomy & Physiology I
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	BIOL 2402	Anatomy & Physiology 2
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	BIOL 2420	Microbiology
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ENGL 1301	English Composition
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	SPCH 1315 (or 1318 or 1321)	Fundamentals of Speech
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	SOCI 1301	Intro to Sociology
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	PSYC 2301	Intro to General Psychology
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	HUMA	Humanities
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	DHYG 1223	Dental Hygiene Practice
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	DHYG 1227	Preventive DH Care
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DHYG 1235	Pharmacology for the DH
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	DHYG 1261	Clinical DH 1
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	DHYG 1271	Service-Learning for Local Need
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DHYG 1301	Oral-Facial Anatomy, Histology, Embryology
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	DHYG 1304	Dental Radiology
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DHYG 1307	General & Dental Nutrition
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DHYG 1311	Periodontology
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	DHYG 1315	Community Dentistry
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	DHYG 1319	Dental Materials
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DHYG 1339	General & Oral Pathology
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	DHYG 1431	Pre-clinical DH
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	DHYG 2201	Contemporary DH Care 1
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	DHYG 2231	Contemporary DH Care 2
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	DHYG 2362	Clinical DH 2
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	DHYG 2363	Clinical DH 3
								<b>COMPETENCY REFERENCES</b>	
								<b>8 Basic use of computers</b>	
								<b>7 Workplace Competencies:</b> resources; interpersonal skills; information; systems; and technology.	
								<b>6 Personal Qualities:</b> A worker must display responsibility, self-esteem, sociability, self-management, integrity, and honesty.	
								<b>5 Thinking Skills:</b> A worker must think creatively, make decisions, solve problems, visualize, know how to learn, and reason effectively.	
								<b>4 Speaking and Listening:</b> Organize ideas and communicate orally; receive, attend to, interpret, and respond to verbal messages and other cues.	
								<b>3 Arithmetic or Mathematics:</b> Perform basic computations and approach practical problems by choosing appropriately from a variety of mathematical techniques.	
								<b>2 Writing:</b> Communicate thoughts, ideas, information, and messages in writing, and create documents such as letters, directions, manuals, reports, graphs, and flow charts.	
								<b>1 Reading:</b> Locate, understand, and interpret written information in prose and in documents such as manuals, graphs, and schedules.	