Common Course Outline
DNHY 115
Dental Radiology
3 Semester Hours

The Community College of Baltimore County

Description

DNHY 115 – 3 Credits- Dental Radiology introduces the dental hygiene student to the basic principles of radiation physics; radiation biology; hygiene and safety factors; radiographic quality assurance; the application and theory of properly exposing, processing, mounting and evaluating radiographs; identification of normal anatomic landmarks and pathologic conditions; client selection criteria; and interpretation of radiographs.

3 credits; 2 lecture hours and 3 laboratory hours per week

Co-requisites: DNHY 110, DNHY 111, DNHY 112, DNHY 113, and DNHY 114

Overall Course Objectives

Upon completion of this course, the dental hygiene student will be able to:

1. discuss the historical development of dental radiography;
2. explain the basic principles and concepts of dental radiation;
3. explain the biological effects of ionizing radiation to various cell types;
4. discuss state and federal regulations concerning the use of dental x-ray equipment and how they affect dental auxiliaries;
5. identify the component parts and workings of the dental x-ray machine and the production of x-rays;
6. identify factors affecting the quality of the x-ray beam and the radiographic image;
7. describe and demonstrate radiation protection procedures for the operator and the client;
8. compare and contrast the different types of intraoral and extraoral radiographic projections;
9. explain the principles of paralleling and bisecting radiographic techniques;
10. compare and contrast similarities and differences of the paralleling and bisecting techniques;

11. identify supplementary techniques and client management including endodontic, localization, edentulous, pedodontic, and techniques for difficult anatomy and clients with disabling conditions;
12. identify the different film types;
13. select the appropriate radiographic surveys,
14. identify and demonstrate proper film processing, handling and record keeping;
15. compare and contrast the various chemicals and their action in the processing solutions;
16. demonstrate proper duplicating procedures, and radiographic record keeping;
17. describe and demonstrate appropriate infection control considerations and protocol of radiography;
18. evaluate proper quality assurance procedures for processing chemistry and the darkroom;
19. discuss common radiographic errors that cause poor radiographs and be able to correct these errors;
20. interpret radiographs for acceptability for diagnostic purposes;
21. identify normal radiographic landmarks, artifacts, and shadows; and
22. identify developmental abnormalities and basic disease processes of teeth and supporting structures.

Major Topics

I. History
   a. Development of radiography
   b. Uses of dental radiographs
II. Principles and Concepts of Radiation
   a. Theory of ionization
   b. Sources and types of radiation
   c. Characteristics of electromagnetic radiations
III. X-Ray Equipment
   a. Electricity and current
   b. Electrical voltage and transformers
   c. Low- and high-voltage circuits
   d. Components of the control panel
   e. Components of the tube head and function of each
   f. X-ray production
   g. Interaction with matter
IV. Quality of the x-ray beam and radiographic image
   a. Beam quality
   b. X-ray quality
   c. Density
   d. Contrast
   e. Definition
   f. Distortion
   g. Processing
   h. Digital images and sensors

V. Effects of ionizing radiation on living tissue
   a. Primary, secondary, scatter radiation
   b. “Critical” organs
   c. Contraindications for dental radiographs
VI. Radiation bioeffects
   a. Radiation terminology
   b. Direct and indirect effects
   c. Latent period and cell recovery
   d. Dose rate and cell recovery
   e. ALARA
VII. Radiation protection, health and safety
   a. Written policies
   b. Reduction in exposure
VIII. Selection of surveys, image receptor, and record keeping
   a. Determination of diagnostic purpose of exposures
   b. Selection of appropriate survey or combination of surveys
   c. Selection of appropriate image receptor
   d. Record keeping and duplicating
IX. Intraoral techniques
   a. Film/sensor sizes and selection
   b. Components of film packet/types of sensors
   c. Interproximal
   d. Occlusal
   e. Periapical
   f. Mounting
X. Supplemental techniques
   a. Client management
   b. Clients with special conditions
   c. Pedodontic surveys
   d. Edentulous surveys
   e. Endodontic
   f. Deliberate displacement
   g. Localization of objects
XI. Film processing, handling, and storing
   a. Manual processing
   b. Automatic processing
XII. Quality assurance
   a. Darkroom
   b. Equipment
XIII. Viewing techniques and principles of interpretation
   a. Viewing
   b. Interpretation principles
XIV. Panoramic radiography and other extraoral techniques
   a. Panoramic theory
   b. Panoramic techniques
   c. Panoramic interpretation

d. Lateral jaw radiography
e. Skull radiography
f. Temporomandibular joint
g. Implant radiography

XV. Digital imaging

XVI. Radiographic interpretation
a. Dental diseases
b. Dental caries and restorations
c. Pulpal
d. Periapical
e. Normal anatomy and shadows
f. Maxillary anatomic landmarks
g. Maxillary shadows
h. Mandibular landmarks
i. Mandibular shadows

XVII. Developmental and acquired abnormalities
a. Variations in morphology
b. Variations in number of teeth
c. Variation in structures
d. Variations in eruption
e. Variations in jaw
f. Acquired variations

XVIII. Legal issues in dental radiography

XIX. Infection control in radiology
a. General principles
b. Procedures

Course Requirements

Grading/exams: Grading procedures will be determined by the individual faculty member but will include a minimum of three quizzes, two laboratory exercises/competencies, and two examinations.

Writing: The individual faculty member will determine specific writing assignments.

Other Course Information

This course is a required course in the dental hygiene degree program. Each week the class meets for a total of two hours of lecture and three hours of laboratory. A grade of "C" or better is required for all dental hygiene courses in order to progress within the program.

Individual faculty members may include additional course objectives, major topics, and other course requirements to the minimum expectations stated in the Common Course Outline.