COURSE NUMBER & TITLE: DAS1501: X-Ray 1
CREDITS: 2 (1 Lec / 1 Lab)
PREREQUISITES: None

CATALOG DESCRIPTION:
X-Ray 1 will teach the students the diagnostic importance of dental X-rays. The student will expose, process, and evaluate X-rays on skulls and mannequins. The student will utilize radiation safety and infection control guidelines. This course is a prerequisite for X-Ray 2.

OUTLINE OF MAJOR CONTENT AREAS:
1. Discovery of X-Rays
   A. Roentgen
   B. Kells
2. Radiation Physics and Biology
   A. The Structure of an Atom and Ionization
   B. Radiation Types
   C. Radiation Units of Measurement
3. Radiation Physics and Biology
   A. The Structure of an Atom and Ionization
   B. Radiation Types
   C. Radiation Units of Measurement
4. Components of the Dental X-Ray Unit
   A. Control Panel
   B. Arm Assembly and Tubehead
5. Safety and Precautions
   A. Manufacture’s Responsibilities
   B. Dentist’s Responsibilities
   C. Dental Assistant’s Responsibilities
   D. Patient’s Responsibilities
   E. Additional Notes on Reducing Radiation Exposure
6. Digital Radiography
   A. Equipment
      1. X-ray machine
      2. Sensor
      3. Computer
   B. Types of imaging
      1. Direct digital
      2. Indirect digital
      3. Storage phosphor
   C. Advantages and disadvantages
7. Producing Quality Radiographs
   A. Preparing for X-Ray Exposure
B. During Image Exposure
C. Patient Exposure
D. After the Images Are Exposed

8. Types of Image Exposures
   A. Periapical
   B. Bite-wing
   C. Occlusal

9. Intraoral Techniques for Image Exposures
   A. Bisecting Technique
   B. Principles
   C. Disadvantages

10. Full-Mouth Radiographic Survey
11. Bite-Wing Series
   A. Positioning for Maxillary Arch
   B. Positioning for Mandibular Arch

12. Producing Special Radiographs
   A. Occlusal Radiographs
   B. Pediatric Radiographs
   C. Edentulous Radiographic Survey
   D. Endodontic Radiographic Technique
   E. Special Needs Patients/Compromised Patients

13. Radiographic Errors
   A. Common Exposure Errors
      1. Distortion
      2. Elongation
      3. Foreshortening
      4. Overlapping
      5. Cone cutting
   B. Common Image Processing Errors
      1. Light image
      2. Dark image

14. Mounting radiographs
   A. Identification dot
   B. Anatomical landmarks
   C. Types of mounts

15. Radiation safety
   A. Specific radiation
      1. Primary radiation
      2. Secondary radiation
      3. Scatter radiation
      4. Leakage radiation
   B. Controlling factors
      1. Kilovoltage
      2. Milliamperage
      3. Exposure time
C. Precautions
   1. Operator shielding
   2. Patient protection
   3. Operator protection
   4. Personnel monitoring
   5. Radiographs during pregnancy
D. State and federal regulations

16. Parallel technique
   A. Holders
      1. XCP’s
      2. Stabes
      3. Rinn’s Unibite
   B. Parallel procedure on mannequins and skulls
   C. Implement infection control
   D. Produce five full mouth series
   E. Mount and critique X-rays
   F. Retake unacceptable films
   G. Complete (omit: and file) X-ray paperwork

COURSE GOALS/OBJECTIVES/OUTCOMES:
1. Students will explain the history of radiation.
2. Students will list the properties of radiation and explain the biological effects of radiation exposure.
3. Students will explain how an x-ray is produced and describe safety precautions when using radiation.
4. Students will describe a diagnostic quality x-ray and identify the means of producing quality radiographs.
5. Students will list standardized procedures and state policies that dental offices follow to ensure quality radiographs.
6. Students will explain the paralleling and bisecting technique including a full-mouth radiographic survey including bitewings.
7. Students will list and describe types of image exposures, special radiographs on various patients, including occlusal, pediatric, edentulous and endodontic radiographs, and special needs/compromised patients.
8. Students will describe the procedure and identify the components of digital radiography.
9. Students will expose digital images on skulls and mannequins.
10. Students will list common radiographic errors that occur during exposure.
11. Students will demonstrate competency in mounting and critiquing dental image surveys.
12. Students will recognize anatomical landmarks on dental images.

MNTC GOALS AND COMPETENCIES MET:
N/A

HCC COMPETENCIES MET:
Working Productively & Cooperatively

**STUDENT CONTRIBUTIONS:**
Attendance is crucial in this class. The student is expected to attend all lectures and laboratory sessions, participate and implement input into class discussions, complete the required full mouth series using the infection control procedure and required paperwork and critiques, and hand in outside assignments when due.

**STUDENT ASSESSMENT SHALL TAKE PLACE USING INSTRUMENTS SELECTED/DEVELOPED BY THE COURSE INSTRUCTOR.**

*Curriculum Committee Approval Date: May 1, 2018*

*AASC APPROVAL DATE: May 9, 2018*

*REVIEW DATE: May 2023*