Medical Imaging Program
MI 132: Imaging Principles and Equipment
Fall 2022
Unit 3: X-Ray Tube - Cathode, Charts, Extending tube life

Due: 10/3/22
Textbook: Chapter 5 pgs. 58 (start at cathode) – 61; Supplemental Pages
Objectives:

- *Describe the function of the filament and focusing cup.*
- *Describe the control of thermionic emission from the filament.*
- *Discuss the necessary characteristics of filament metals and construction.*
- *Calculate heat units as specified for specific generator types.*
- *Use tube rating charts, anode cooling charts and housing cooling charts.*
- *Employ methods of safe x-ray tube operation and extending x-ray tube life.*

Lecture 3:

1. What function does the cathode have in the production of x-rays?

2. List and describe the two components of the cathode:

3. Describe the process of thermionic emission?

4. Identify the steps involved in the process of x-ray operation:

5. Explain the space charge effect.

6. Where are x-ray photons produced?

7. What factors can damage or shorten the life of the x-ray tube?

8. Describe the purpose of tube rating charts and cooling charts

9. What is the equation for calculating heat units?

10. What procedures and guidelines should be followed to extend tube life?