**BMR 1112 PHYSICS OF IMAGING & IONIZING RADIATION**

Course description:

This course presents a study of radiation physics and radioisotopes including the theoretical basis for understanding the nature, production and interaction of radiation with matter, atomic and electrical physics as it pertains to radiation production and control. The course further aims to provide introductory knowledge of radiation biology and physics, sufficient for the students to subsequently understand and

practice radiation safety as well as appreciate the legislative framework. The unit also covers theories of

justification, optimization and limitation in control of ionizing radiation. The course also explores concepts in radiographic exposures.

Purpose**:**

To enable the student learn the knowledge of radiation physics, radioisotopes and appreciate the principles of radiation protection and safety.

Course Objectives:

By the end of the 5 weeks, the student should be able:

• To describe the characteristics of matter and energy

• To identify the various forms of energy

• To define electromagnetic radiation and specifically ionizing radiation

• To discuss ionizing radiation and its various sources

• To relate the discovery of the x-rays by Roentgen

• To discuss the effects of ionizing radiation on humans and environment.

• To outline the concepts of basic radiation protection

• To describe the structure and functions of x-ray tube

• To explain the concepts of radiographic exposure factors

• To relate physical principles of radiation to the construction of the dark room

Expected outcomes/competencies

A student who:

• Understands the nature and production of ionizing radiation

• Is aware of biological effects of radiation

• Safely applies radiation to patient imaging and therapy

• Practices radiation safety culture at the place of work

Content outline:

• Basic Units of measurements

• Heat and Temperature

• Electricity

• Magnetism

• Structure of matter

• Production of x-rays and the x-ray tube

• Radioactivity

• Cell radiobiology

• Darkroom and radiation protection.

Delivery methods:

Over-view lectures, Small group tutorials with a Tutor, Self-directed study, Wrap-up seminars, Question and answer sessions, Skills training, Assignments, practicals and Videos for watching.

Assessment methods:

There shall be an assessment blue-print for assessment.

Formative and summative assessment shall be conducted through MCQs.

Essays, short answer questions, Objective Structure Clinical Examination (OSCE), Objective Structure

Practical Examination (OSPE) and logbook/ Portfolio

Course duration**:** 5 Weeks

Requirements**:** 75 CH, 5CU Resources & Infrastructure available:

Libraries, Book banks, Tutorial rooms, Computer services and internet, Content experts and audiovisual

materials/ resources. X-ray (Laboratory) rooms

And IT Labs

Teaching staff: List attached