

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)
School of Health Sciences
Department of Medical Laboratory Sciences
COURSE OUTLINE

COURSE CODE: BML 124 **COURSE TITLE:** Physics for MLS

COURSE PURPOSE:

To provide the students with an overview of Physics principles as applied in reference to Medicine and medical sciences. At the end of the course, students are expected to have conceptualized these principles in relation to their application in Medicine and specifically, Medical Laboratory Sciences. Additionally, this course provides the students with the basics to understanding Bioinstrumentation in Medical Laboratory Sciences.

Learning outcomes

By the end of the course the learner will be able to:

- a) Describe the principles and applications of molecular theory and mechanics
- b) Explain the principles of energy and magnetism and their applications
- c) Describe the characteristics of sound waves and their applications
- d) Describe the characteristics of light and their applications in optics
- e) Explain the basic principles of nuclear physics and their applications

Content

1. Fundamental units and dimension analysis, Newton's Laws and particle dynamics, work and energy, conservation of energy and linear momentum, collisions.
2. Gravitation, fluid dynamics and static, pressure, force.
3. Heat as a form of energy, temperature, first law of thermodynamics, introduction to kinetic theory.
4. Matters and change, the electric field Gauss's law, electric potential, capacitors and dielectrics, stored energy, magnetic effects of current, electrical measuring instruments, electrical circuits, Kirchoffs Law, Wheatstone bridge, meter bridge, potentiometers, heating effect of current, amphere's law; magnetostatic; e.m. induction, self inductances and mutual inductance.
5. Transformer magnetic properties of matter, simple harmonic oscillations of mechanical systems, modes of vibrations, reflection and transmission of sound waves impedance matching Doppler effect; electromagnetic waves, concepts of interference.
6. Photoelectric effect; x-rays and Compton effect, modes of action, emission and absorption spectrum, Bohr's theory of H-atom. Nuclear physics and natural radioactivity
7. Principal quantum numbers. Pauli Exclusion Principle. Quantum ideas, waves and particles, de Broglie relation,
8. The wave equation in rectangular and polar coordinators superposition of waves, coherence of light visibility of fringes.
9. The phenomenon of diffraction, Fraunhofer diffraction at a single slit, double slit. Resolving power of grating, prisms. The phenomenon of polarization of light, various methods of light. Various methods of producing plates. The Nicol Prism optical activity.

COURSE REQUIREMENTS

Attendance

- Attendance for lectures, and other scheduled classes/practical/laboratory sessions is mandatory for all students
- Any absence will prohibit the student from taking CATS and Examination.

Learning Assessment Methods

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| • Continuous Assessment Tests (CAT) | 30% |
| • Assignments | 10% |
| • Examination | 60% |
| • Total Marks | 100% |