

University of Al-Anbar

College of Pharmacy

Department of Clinical Laboratory Sciences

Title of the course: *Medical Physics* Course number: **129**

Level: 1st Class, 2nd Semester

Credit hours: **Theory 2 hours Laboratory 1 hour**

Tutors:

Reference text: *Physics for Biology and Medical Students, (Latest edition)*.

Objectives: Gives students the ability to deal with the concepts of physics, emphasizes the knowledge and skills required to efficiently discharge the duties and responsibilities of the pharmacist. The course deals with the concept of basic physics and application of physics in the medical field. Upon completion of the course the students will be able to understand the physical terminology and abbreviation used to describe the lecture, and the application in medical field.

No	Lecture title	hours
1.	General concepts: Method of physics and standards; thermodynamics system and system properties; conservation of energy principle; application of thermodynamics; the Zeroth law.	3
2.	Pressure; temperature and temperature scales (Celsius, Fahrenheit, Kelvin); equation of state; ideal gas and real gas; general law of gases; clauses equation and Vander Waales equation; equilibrium and types of equilibrium; compressibility factor, coefficient of volume expansion, elastic coefficient (bulk modulus).	5
3.	Heat and energy; work and mechanical forms of work; power; the 1 st law of thermodynamics; Boyles and Charles law; practice exercises.	3
4.	The 2 nd law of thermodynamics; reversible and irreversible process; entropy and enthalpy; internal energy; heat capacity and adiabatic process; the relation between pressure, volume, and temperature in adiabatic process.	5
5.	Fundamental of physics: Kinetic theory of a gas; electromagnetic waves; Maxwell equations; physical optics.	5
6.	Radiation: Kirshoffs law; planks law; Stefan-Boltzman law; Wiens law; Black body and Albedo; Heat transfer (radiation, convection, conduction).	6
7.	Production of X-Ray and X-Ray spectra; absorption of X-Ray; U.V and IR effects; medical and biological effects of radiation; radiotherapy.	3