

ACADEMIC PLANNER & UNITIZATION OF SYLLABUS

Department of PHYSICS

Bankura Christian College

ACADEMIC YEAR 2022-23 (Semester -IV)

4th Semester (January to June)

Teacher Name : Debendranath Das

Sec T3 – Radiation Safety

MONTH/YEAR	WEEK	PORTIONS
Mar 2023	2	Basic concept of atomic structure, X rays characteristic and production, concept of Bremsstrahlung and Auger electron
	3	The composition of nucleus and properties, mass number, isotopes of element, spin, binding energy, stable and unstable isotopes, Laws of radioactive decay.
	4	Mean life and half-life, basic concept of alpha, beta and gamma decay, concept of cross section and kinematics of nuclear reactions, Fusion and Fission.
MONTH/YEAR	WEEK	PORTIONS
April 2023	1	Pair production. Alpha, Beta Gamma and neutron and their sources, sealed and unsealed sources, Interaction of photons- Photo-electric effect, Compton scattering,
	2	Linear and mass attenuation coefficient, Interaction of charged particles, Heavy- charged particles, Beth-Block formula, scaling Laws
	3	Mass stopping power, Range, Straggling, Channeling and Cherenkov radiation, Beta particles – Collision and radiation loss
	4	(ALI) and Derived air concentration(DAC) Basic ideas of different units of activity, KERMA, exposure, absorbed dose, equivalent dose, effective dose, collective equivalent dose, Annual Limit of Intake
MONTH/YEAR	WEEK	PORTIONS
May 2023	1	Radiation detection: Basic concepts and working principles of gas detectors, Ionisation chamber, Proportional counters
	2	Multi-wire proportional counter, Gieger Muller counter
	3	Scintillation detectors: Inorganic and organic scintillators, Solid state detectors and neutron detectors, Thermo luminescent detectors
	4	Radiation Safety Management: Biological effects of ionising radiation, Operational limits and basics of radiation hazards evaluation and control: radiation protection standards
MONTH/YEAR	WEEK	PORTIONS
June 2023	1	International Commission of on Radiological Protection (ICRP) principles, justification, optimization, limitation. Introduction of safety and management of radiation.
	2	Nuclear waste and disposal management. Brief idea of accelerator driven Sub-critical system(ADS) for waste management.
	3	Application of nuclear techniques: Application in medical science(e.g., MRI, PET, Projection Imaging Gamma Ray Camera, Radiation Therapy,
	4	Archaeology, Art, Crime detection, Mining and oil. Industrial uses: Tracing, Guazing, Material Modification, Sterilisation, Food preservation.
	5	Revision/ Tutorial on Unit 3/Unit Test Revision