CY-315 NUCLEAR & RADIATION CHEMISTRY

Atomic nucleus, Nuclides, Nuclear stability, Modes of decay, Nuclear models (shell + liquid drop model), Fusion and fission, Non spontaneous nuclear processes, Nuclear reactors, Beta decay, Systematic nuclear spins.

Nuclear Reactor: Design types and working of reactor.

Detection Methods: Methods based on ion collection, Scintillation detectors, Semiconductor detectors, Discussions on specific applications of detection devices.

Study of Labeled Compounds: Preparation and dispersion of labeled compounds, Details of job oriented labeled compounds.

Statistics of Radioactive Decay: Decay rate and statistics, Practical consideration, Optimum counting rate, Background count.

Radiation Protection and Control: Units of radiation exposure, Safety measures.

Radioisotopes in Chemical Applications: Radiocarbon dating, Isotope dilution techniques, Neutron activation analysis, Radiometric analysis, Gravimetric methods, Radio immune assay, Applications of radioisotopes in pharmaceutical dispersions, Radio tracers in chemical applications, Study of self-exchange reactions.

Mosbauer Spectroscopy: Basic information, Experimental technique Parameters and chemical applications of Mossbauer spectroscopy.

Radiation Dosimetry: Dose, Absorbed dose units, Radiation yields, Dosimetry methods of absolute measurement, Chemical dosimetry, Fricke dosimeter, Dosimetry in pulse radiolysis.

Reactions in Radiation Chemistry: General energy transfer, Characteristics and applications of gas, liquid and solid phase radiolysis, Instrumentation, Purity of chemicals and methods, Recent applications of radiation chemistry, Radiation hazards and safe disposal of radioactive wastes.