MANGALORE UNIVERSITY
DEPARTMENT OF BIOSCIENCES
MSc BIOTECHNOLOGY

BTS 454 BIOANALYTICAL TECHNIQUES (SOFT CORE COURSE)
Hours: 40

Course outcome

Students will be able to:

- apply the principle, instrumentation of bio analytical techniques such as chromatography and electrophoresis for the separation of different biomolecules
- learn the principle and application of different spectroscopic methods for the structural analysis of biomolecules.
- demonstrate the application of radioisotope techniques for the quantification of biomolecules based on isotope labelling.
- understand the types and properties of different nanostructures and nanoparticles for the future application of nanotechnology in different fields of science.

UNIT I (13 hrs)

Principle, instrumentation and applications of separation techniques for different biomolecules and applications: Chromatography – paper, TLC, Gel filtration, ion exchange, affinity, HPLC and GC. Electrophoresis - gel, agarose-gel, PAGE, SDS-PAGE, Iso-electric focusing.

UNIT II (13 hrs)

Physical techniques in structural analysis of biomolecules and applications: Spectroscopy: principle, instrumentation and application of UV-visible, fluorescent, CD,NMR, ESR spectroscopy, Atomic absorption spectroscopy, Plasma emission spectroscopy, X-ray diffraction, Mass spectroscopy.

UNIT III (14hrs)

Principle, instrumentation and applications of Centrifugation and ultracentrifugation. Radioisotope techniques - nature of radiation sources, radioactive decay, units of radiation, detection and measurement of

radioactivity, GM and scintillation counters and autoradiography. Principles of nanotechnology - Nanostructures, nanoparticles and their properties. Applications. Green synthesis of nanoparticles.

References

1) Principles of instrumental analysis. Skooge DA., Holler FJ., Crouch SR., Thompson Brooks Publ., 1988
2) Basic concepts of analytical chemistry. Khopkar SM. New Age International Publ. New Delhi, 1998
3) Principles and Techniques of Biochemistry and Molecular Biology, K. Wilson and J. Walker (Eds.) 6th Ed., Cambridge Univ. Press, 2005