

Programme: M. Sc. (Biochemistry)

Course Code: BCC 405 **Title of the Course:** Laboratory course in Biochemistry-I

Number of Credits: 4

Effective from AY: 2021-22

<u>Prerequisites for the course:</u>	Should have basic knowledge on Biochemistry.	
<u>Course Objectives</u>	1. This course develops basic understanding and skills of various instruments and techniques in biochemistry, analysing biomolecules, Analytical biochemistry, Cell biology and Molecular biology.	
<u>Course Outcomes</u>	<ol style="list-style-type: none">1. The Biomolecules unit of the practical will train the students with skilful handling and estimating biomolecules and other metabolic products.2. Analytical Biochemistry-I part of this practical will explain the principle and working of basic instruments in analytical laboratory that will train the students in handling various instruments in Analysis.3. Molecular Biology unit of the practical will teach the students techniques involved in genomic DNA isolation and PCR amplification for its use in molecular research.4. Field trip/study tour unit of this course will help the students to understand the working of industries and research institutions and provide them an insight of the prospects available to them. The students will understand the activities and research being carried out in industries and research institutes which reflects the applications of biochemical principles.	
<u>Content</u>		
	I. Biomolecules <ol style="list-style-type: none">1. Standard curve for glucose by DNSA and quantitative estimation of test sample.2. Colorimetric methods for protein estimation – Biuret method	24 h

	3. Colorimetric methods for protein estimation –Folin-Ciocalteu methods. 4. Estimation of total sugar by anthrone method. 5. Estimation of amino acids (ala, tyr, trp) and protein by direct spectroscopy. 6. Estimation of nucleic acid by direct spectroscopy.	
	II. Analytical Biochemistry-I 1. Calibration of pH meter/weighing balance. Preparation of buffers using pH meter and determination of pH of given sample 2. Separation of compounds based on their chemical nature by solvent extraction. 3. Separation of lipids by thin layer chromatography 4. Separation of organic compounds by thin layer chromatography 5. Column chromatographic separation of organic molecule. 6. Separation of alpha amino acids by paper chromatography. 7. Separation of molecules by HPLC.	24h
	III. Molecular Biology 1. Preparation and maintenance of microbial culture 2. Isolation of genomic DNA of bacterial cells 3. Estimation of quantity and purity of DNA by spectrophotometry, 4. Agarose gel electrophoresis of bacterial DNA 5. PCR amplification of a specific gene using genomic DNA as a template. 6. Agarose gel analysis of PCR product to determine amplicon size.	24
	IV. Field trip/Study tour 1. Visit to Research/Academic Institutes: National Centre for Antarctic and Ocean Research [NCAOR], National Institute of Oceanography [NIO], BITS-Pilani, K.K.	24 h

	<p>Birla, Goa campus and ICAR-Central Coastal Agricultural Research Institute (ICAR-CCARI).</p> <p>2. Visits to Industries:</p> <p>Pharmaceutical industry, Agricultural farming, Food and beverage.</p> <p>3. Report writing:</p> <p>Students are supposed to submit report highlighting the following points:</p> <ul style="list-style-type: none"> i. Instrumental facility and their applications ii. Industrial processes and products iii. Quality checking parameters iv. Ongoing research work. <p>4. Evaluation:</p> <ul style="list-style-type: none"> i. Every student is supposed to present his/ her report in Departmental council. <p>Evaluation will be based on report writings, oral presentation and viva.</p>	
Pedagogy:	Lectures/ tutorials/ laboratory work/ field work/ project work/ viva/ seminars/ assignments/ term papers.	
Text Books/ References / Readings:	References given under respective theory courses (BCC 401, BCC 402, BCC 403) may be referred.	