DEPARTMENT OF MICROBIOLOGY				*CLASS: II B.Sc. Microbiology*				
Sem	**Course Type**	**Course Code**	**Course Title**	**Credits**	**Contact Hours/week**	**CIA**	**Ext**	**Total**
III	Major Core Practical - III	20U3RMP3	Major Practical – III-	2	3	40	60	100

Nature of Course				
Knowledge and skill			Employability oriented	✓
Skill oriented	✓		Entrepreneurship oriented	

Course Objectives:

1. Provide hands on training to perform basic laboratory techniques in chemistry and biology
2. Provide fundamental principles, such as the structure/function of biomolecules, regulation of biological/biochemical processes
3. Analyse antibiogram of bacteria
4. Perform separation techniques of biomolecules
5. Explore microbiology of cosmetics

Course Learning Outcomes:

On successful completion of the programme, the students will be able to

1. Perform basic laboratory techniques in both chemistry and biology
2. Prepare chemicals and buffers for biological reactions
3. Identify and quantify the amount of biomolecules present in the samples
4. Analyse Microbiological assay of antibiotics
5. Perform testing of Cosmetics and Personal Care Products

Sl.No.	Experiments
1	Measurement of pH of various samples using pH meter
2	Buffer preparation (Verification of Henderson-Hassel Balch equation)
3	Verification of Beer's Law
4	Separation of amino acids bypaper chromatography and TLC
5	Qualitative analysis of carbohydrate (monosaccharides, disaccharides and polysaccharides).
6	Microbiological assay of antibiotics
7	Antimicrobial Preservative Effectiveness Test (Challenge Test)
8	Minimum Inhibitory Concentration (MIC test)
9	Microbiological Testing of Cosmetics and Personal Care Products.
10	Suitability and Validation of microbiological tests in cosmetics

Books for Reference

1. Plummer, D.T. (2008) An Introduction to Practical Biochemistry. Tata McGraw- Hill Publication, New Delhi
2. Dua, S and Garg, N. (2010) Biochemical methods of analysis. Narosa Publishing, New Delhi.
3. Nigam and Ayyagai, A. (2007) Lab Manual in Biochemistry, Immunology and Biotechnology. Tata McGraw- Hill Publication, New Delhi
4. Wilson, K and Walker, J. (2008). Practical Biochemistry. Cambridge State University Press, U.K.
5. Boyer, R.F. (2012) Modern Experimental Biochemistry, Pearson Education, India.

Web Resources

1. https://en.wikipedia.org/wiki/blue_white_screen
2. https://www.ncbi.nlm.nih.gov/pmc/articles/pmc169282/
3. https://rajswasthya.nic.in/RHSDP%20Training%20Modules/Lab.pdf
4. https://www.ouh.nhs.uk/biochemistry/tests/
5. https://iubmb.onlinelibrary.wiley.com/doi/10.1002/bmb.2003.494031020192

Rationale for nature of the course

This course provides an in-depth knowledge and practical skills pertaining to separation and estimation of various biological macromolecules. It explores the role of preservatives in the field of cosmetology and highlights the production of microbiologically safe cosmetic products.

Activities having direct bearing on skill development/ employability/entrepreneurship

- Hands-on experience in separation and identification of biomolecules
- Testing and validating microbiologically safe cosmetic products.
- Applying knowledge on antimicrobial compounds in cosmetics, personal care and hygiene products.

Pedagogy

Demonstration and practical session.

Course Learning Outcomes (CLO)

CLOs	Course Learning Outcomes On successful completion of the programme, the students will be able to	Knowledge Level
CLO1	Perform basic laboratory techniques in both chemistry and biology	Up to K1
CLO2	Prepare chemicals and buffers for biological reactions.	Up to K2
CLO3	Identify and quantify the amount of biomolecules present in the samples.	Up to K2
CLO4	Analyse Microbiological assay of antibiotics	Up to K2
CLO5	Perform testing of Cosmetics and Personal Care Products	Up to K3

K1 –Remembering and recalling facts with specific answers
K2 – Basic understanding of facts and stating main ideas with general answers
K3 – Application oriented – Solving Problems
K4 – Examining, analyzing, presentation and make interferences with evidences

Mapping of Course Learning Outcome with Programme Specific Outcome

	PSO1	PSO2	PSO3	PSO4	PSO5
CLO1	2	2	2	2	3
CLO2	2	2	2	3	2
CLO3	2	3	2	2	3
CLO4	3	2	2	2	2
CLO5	2	2	3	2	2

Advance application – 3, Intermediate level – 2, Basic level – 1.

Mapping of course outcome with Programme outcome

	PO1	PO2	PO3	PO4	PO5
CLO1	2	2	3	2	2
CLO2	2	3	2	2	2
CLO3	2	2	3	3	2
CLO4	3	3	2	2	3
CLO5	2	2	2	2	2

Advance application – 3, Intermediate level – 2, Basic level – 1

Course designers:

1. Dr. A. P. AshaKannan