

	Implementation schedule	Physically/remotely	Workload (hours) On site or remotely	Autonomous work for students (max hours)	Learning outcomes
Activity 1 Biomaterials	To provide an overview of biomaterials and their bioactivity. Understanding of Biomaterials Science and how biomaterials science integrates with other fields such as biology, chemistry, engineering, and medicine.	Physically/remotely	10	20	Introduce the students to biomaterials and provide a comprehensive understanding of the materials used in biomedical applications.
Activity 2 Collagen	Collagen: one of the most significant biomaterials due to its natural abundance, biocompatibility, & unique properties. Collagen is the main structural component of connective tissues like skin, bone, cartilage, tendons, and ligaments. In medical and biomedical applications, it serves as a highly versatile material that can mimic the structure and function of natural tissues.	Physically/remotely	20	10	Understanding collagen biological significance functions, sources and applications in health and wellness. By the end of this activity students should be able to understand the structure and types of collagen, describe the role of collagen in the organisms and understand the synthesis process.
Activity 3 Collagen extraction	Collagen extraction from animal tissues : a multi-step process that includes tissue preparation, decellularization acid or alkaline extraction, enzymatic digestion, and purification. The extracted collagen can be used in a wide variety of applications, including wound healing, tissue engineering, cosmetic	Physically	33	2	Possess the knowledge of collagen extraction from animal tissues, particularly from bovine, porcine, and fish sources. It is used for wound healing, skin grafts, tissue scaffolds, and

	products, and drug delivery systems				bone regeneration.
Activity 4 Purification of Collagen – Concentration and Lyophilization-Characterization of collagen	Purification of collagen after extraction from animal tissues is a crucial step to ensure that the final product is free from contaminants such as non-collagenous proteins, lipids, cellular debris, or any other unwanted components. The processes of concentration and lyophilization are essential in purifying and stabilizing collagen for various biomedical and industrial applications.	Physically	33	2	During this activity the students should identify the steps involved in collagen extraction and purification, understand its importance while lyophilization would help students appreciate how water is removed from collagen while preserving its native structure. Finally, characterizing collagen is crucial for understanding its structure, function, and suitability for various applications
Activity 5 Report	Report on the abovementioned activities	Physically/remotely	5	20	Deep understanding of the content of the abovementioned activities
Activity 6 Presentation	Presentation of the abovementioned activities	Physically/remotely	5	15	Deep understanding of the content of the abovementioned activities
Total			106	69	