Name of the Programme: M.Sc. Biotechnology

Course Code: GBT-507

Title of the Course: STEM CELL BIOLOGY AND REGENERATIVE MEDICINE

Number of Credits: 1

Effective from AY: 2022-23

Pre-requisites for the Course:	Basic understanding of cell biology - cell types, growth media, cell division, cell growth, and cell differentiation.	
Course Objectives:	The aim of the course is 1) to bring together cellular, biochemical, anatomical, histological, physiological and evolutionary medical views of stem cells 2) to obtain a coherent picture of stem cell and their use in experimental and clinical context	
Content:	**MODULE I** • Definition, stem cell origins and plasticity, classification and source of stem cells; Stem cell differentiation; • Stem cells cryopreservation, iPS technology; microRNAs and stem cell regulation, Tumor stem cells, • Overview of embryonic and adult stem cells for therapy. Human stem cells research: • Ethical considerations; • Stem cell based therapies: Pre-clinical regulatory consideration and patient advocacy.	**No. of hours** 15
Pedagogy:	Lectures/tutorials/assignments	
References/ Readings:	1. A.D. Hoffman, Stem Cell Transplantation Biology Process Therapy, Willy-VCH, 2006. 2. J. Collins, Stem cells: From basic to advanced principles, Hayle Medical, 2017. 3. R. Lanza, Essential of Stem Cell Biology, Academic Press, 2006. 4. R. Lanza, Essential stem cell methods, Elsevier, 2009. 5. R. Lanza, Principle of Tissue Engineering, AP publisher, 2011. 6. 6. R. Lanza, Essential of Stem cell Biology, Elsevier publisher, 2013.	

Course Outcomes:	1. Student will get theoretical and practical knowledge of stem cells. 2. This course will provide them knowledge and scope of emerging medical applications in regenerative medicine 3. Course will provide knowledge of scope of animal cell culture and animal models in medical industries 4. This course will offer student to think toward medical entrepreneurship.

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