Course contents for Tissue Engineering

1. **Faculty:** FLSB
2. **Course Code:**
3. **Course Title:** Tissue Engineering
4. **Number of Credits:** Two
5. **Course objectives:**

   Tissue Engineering comprises the medical applications of the biotechnology such as cell based therapies and nanotechnology for replacing cells and/or tissues. In this course, the students will be taught on basic stem cell biology and other cells,, their use in regenerative medicine, cell transplantation, nano-based technologies and ethics.

6. **Minimum prerequisites for taking this course, if any:**
   Basic knowledge of Cell biology, Molecular biology and Developmental Genetics would be expected.

7. **Course structure with units, if applicable:**

   Unit 1: Introduction to cells and tissue development.
   Unit 2: Stem cell biology and its applications in therapy..
   Unit 3: Various methods used in the generation of tissue specific differentiation of stem cells.
   Unit 4: Biomaterials and Tissue engineering.
   Unit 5: Cell therapy.
   Unit 6: Regulation and ethics.

8. **Reading suggestions:**

   a. **Essentials of Stem Cell Biology** by Robert Lanza.
   b. **Cell Therapy: cGMP Facilities and Manufacturing** by Adrian Gee.
   c. **Essentials of Stem Cell Biology** by Cyndy D. Davis and Paul R. Sanberg.
   d. Cancer Stem Cells, by William L. Farrar
   e. **Induced Pluripotent Stem Cells** by Sibel Yildirim.
   f. **Human Embryonic Stem Cells** by Arlene Chiu and Mahendra S. Rao.
   g. **Introduction to Nanoscience and Nanotechnology** by Chris Binns.
   h. **Fundamentals of Nanotechnology** by Gabor L. Hornyak, John J. Moore, H.F. Tibbals and Joydeep Dutta.
   i. **Medical Nanotechnology and Nanomedicine** by Harry F. Tibbals.
   j. **Nanotechnology Intellectual Property Rights: Research, Design, and Commercialization** by Prabuddha Ganguli and Siddharth Jabade

9. **Evaluation:**

Theory: Mid-semester Written Examination	: 40% Marks
End-semester Written Examination	: 40% Marks
Quiz / Assignment/Presentation (oral / poster) /other	: 20% Marks