

4	Dietary supplements: Toxicology and Clinical Pharmacology by Cupp, J., Tracy, TS. Humana Press.
5	Functional Food Ingredients and Nutraceuticals: Processing Technologies by Shi, J. CRC Press
6.	Nutritional Genomics: Impact on Health and Disease by Brigelius-Flohé, J., Joost, HG. Wiley-VCH
7.	Bioprocesses and Biotechnology for Functional Foods and Nutraceuticals by Neeser, JR., German, BJ. Marcel Dekker
8.	Nutritional Genomics: The Impact of Dietary Regulation of Gene Function on Human Disease by Wayne R. Bidlack, Raymond L. Rodriguez. CRC Press

## TISSUE ENGINEERING AND ARTIFICIAL ORGANS

### Details of course :-

Course Title	Course Structure			Pre-Requisite
	L	T	P	
<b>Tissue engineering and artificial organs (BT422)</b>	03	01	00	Nil

### Course Objective:

The goal of tissue engineering and artificial organs is to understand tissue and its interface with biomaterials and assemble functional constructs that restore, maintain, or improve damaged tissues or whole organs.

### Course Outcome (CO):

1. To illustrate the basic biological concepts
2. To describe the application of biomaterials to construct scaffolds for development of artificial organs.
3. To demonstrate the design and development of artificial organs
4. To introduce the types functionality and validation of artificial organs.
5. Understanding the case studies.

S.No.	Content	Contact Hours

1	Historical perspective and introduction: Historical perspective of tissue engineering industry and products; Cell and Tissue Biology: Introduction to basic biology concepts; Stem cells and its applications.	8
2	Scaffolds for tissue engineering: Classification of scaffold materials, criteria for ideal scaffold, control of architecture; Design and Clinical Implementation	10
3	Design of artificial organs: Substitutive medicine, Biomaterial Concentration, Outlook for Organ Replacement, Design Consideration, Evaluation of Artificial Organs. Artificial Heart and Circulatory Assist Devices	10
4	Artificial organ studies: Artificial lungs; Artificial kidney; Artificial pancreas; Artificial blood; Artificial liver	8
5	Case studies: Comparison of Artificial Lungs and Natural Lungs, Insulin therapy	6
Total		42

#### Books:-

S.No.	Name of Books/ Author/Publisher
1	Biomaterials, artificial organs and Tissue engineering, Larry L. Hench, JulianR Jones, Wood head Publishing Ltd, 2005.
2	Principle of Tissue Engineering, Robert P.Lanza, Robert Langer William L.Chick. Academic Press, 2004.
3	Tissue Engineering, by Palsson and Bhatia (eds.), Pearson Prentice Hall, 2004.
4	Tissue Engineering and Artificial Organs by Joseph D.BronzinoCardiogenic Shock by StevenM. HollenBerg.
5	Biomaterials, Artificial Organs and Tissue Engineering by Larry L.Hench and Julian R.Jones.

