

### Life Sciences for Engineers

<b>Course Code</b>	19BS1303	<b>Year</b>	II	<b>Semester</b>	I
<b>Course Category</b>	Basic Sciences	<b>Branch</b>	CSE	<b>Course Type</b>	Theory
<b>Credits</b>	2	<b>L-T-P</b>	2-0-0	<b>Prerequisites</b>	-
<b>Continuous Internal Evaluation :</b>	30	<b>Semester End Evaluation:</b>	70	<b>Total Marks:</b>	100

#### Course Outcomes

Upon successful completion of the course, the student will be able to:

<b>CO1</b>	Apply principles of biology to create tangible and economically viable engineering goods.	<b>L3</b>
<b>CO2</b>	Employ knowledge and expertise bio-engineering field.	<b>L2</b>
<b>CO3</b>	Improve the living standards of societies.	<b>L3</b>
<b>CO4</b>	Gain knowledge in genetic engineering.	<b>L1</b>
<b>CO5</b>	Implement the knowledge in genetic engineering in industrial field.	<b>L3</b>

#### Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:Substantial, 2: Moderate, 1:Slight)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
<b>CO1</b>	3						2							
<b>CO2</b>	3						2							
<b>CO3</b>	3						2							
<b>CO4</b>	3						2							
<b>CO5</b>	3						2							

**Course Content**

<b>UNIT-1</b>	<b>Introduction to Biology:</b> Comparison of Biological organisms with manmade systems- eye and camera, flying bird and aircraft. Classification of living organisms- Cellular basis of life, differences between prokaryotes and eukaryotes, classification on the basis of carbon and energy sources.	<b>CO1, CO3, CO5</b>
<b>UNIT-2</b>	<b>Bio-molecules:</b> Structure and functions of proteins and nucleic acids, hemoglobin, antibodies. Enzymes-Industrial applications, Fermentation and its industrial applications.	<b>CO1, CO2</b>
<b>UNIT-3</b>	<b>Bioenergetics and Respiration:</b> Glycolysis and TCA cycle, Electron transport chain and oxidative phosphorylation, Mechanism of photosynthesis. Human physiology.	<b>CO2, CO3</b>
<b>UNIT-4</b>	<b>Genetic</b> Mendel's laws, gene mapping, Mitosis and Meiosis, Epistasis, single gene disorders in humans. Genetic code. <b>Engineering:</b>	<b>CO2, CO4, CO5</b>
<b>UNIT-5</b>	<b>Recombinant DNA Technology:</b> Recombinant vaccines, transgenic microbes, plants and animals. Animal cloning, biosensors, biochips.	<b>CO1, CO4, CO5</b>
<b>Learning Resources</b>		
<b>Text Books</b>	1. Biology: A global approach, N. A. Campbell, J. B. Reece, L. Urry, M. L. Cain and S. A. Wasserman, Tenth Edition, 2015, Pearson. 2. Biology for Engineers, Arthur T Johnson, 2011, CRC press.	
<b>Reference Books</b>	1. The molecular biology of the cell, Alberts et al., Sixth Edition, 2014, Garland Science. 2. Outlines of Biochemistry, E. E. Conn, P. K. Stumpf, G. Bruening and R. H. Doi, Fifth Edition, 2009, John Wiley and Sons. 3. Introduction to Biomedical Engineering, John Enderle and Joseph Bronzino, Third Edition, 2012, Academic Press.	