LIFE SCIENCES FOR ENGINEERS

Course Code	19BS1303	**Year**	II	**Semester**	I
Course Category	Basic Sciences course	**Branch**	ME	**Course Type**	Theory
Credits	2	**L – T – P**	2 – 0 – 0	**Prerequisites**	Nil
Continuous Internal Evaluation	30	**Semester End Evaluation**	70	**Total Marks**	100

Course Outcomes		**Levels**
After successful completion of the course, the student will be able to		
CO1	Apply the principles of biology to create tangible and economically viable engineering goods.	L3
CO2	Know and illustrate bio-engineering field.	L2
CO3	Analyze the importance of bioenergetics and apply the knowledge to improve the living standards of societies.	L4
CO4	Gain the knowledge in genetic engineering.	L1
CO5	Design and develop new technologies in genetic industrial field.	L5

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3-High, 2: Medium, 1: Low)														
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3						2						1	
CO2	3						2						1	
CO3	3						2						1	
CO4	3						2						1	
CO5	3						2						1	

Syllabus		
Unit No.	**Contents**	**Mapped COs**
I	**INTRODUCTION TO BIOLOGY** 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	CO1 CO3 CO5
II	**BIO-MOLECULES** Structure and functions of proteins and nucleic acids, hemoglobin, antibodies. Enzymes-Industrial applications, Fermentation and its industrial applications.	CO1 CO2
III	**BIOENERGETICS AND RESPIRATION** Glycolysis and TCA cycle, Electron transport chain and oxidative phosphorylation, Mechanism of photosynthesis. Human physiology.	CO2 CO3
IV	**GENETIC ENGINEERING** Mendel's laws, gene mapping, Mitosis and Meiosis, Epistasis, single gene disorders in humans. Genetic code.	CO2 CO4 CO5
V	**RECOMBINANT DNA TECHNOLOGY** Recombinant vaccines, transgenic microbes, plants and animals. Animal cloning, biosensors, biochips.	CO1 CO4 CO5

Learning Recourse(s)
Text Book(s)
1. N. A. Campbell, J. B. Reece, L. Urry, M. L. Cain and S. A. Wasserman, "Biology: A global approach", Pearson Education Ltd, 2018. 2. Arthur T Johnson, Biology for Engineers, CRC press, 2011.
Reference Book(s)
1. Alberts et al., The molecular biology of the cell, 6/e, Garland Science, 2014. 2. E. E. Conn, P. K. Stumpf, G. Bruening and R. H. Doi, "Outlines of Biochemistry", John Wileyand Sons, 2009. 3. John Enderle and Joseph Bronzino, "Introduction to Biomedical Engineering", 3/e, 2012.