

LIFE SCIENCES FOR ENGINEERS

Course Code	19BS1404	Year	II	Semester	II
Course Category	Basic Sciences	Branch	EEE	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														
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.													
CO2	Know and illustrate bio-engineering field.													
CO3	Analyse the importance of bioenergetics and apply the knowledge to improve the living standards of societies.													
CO4	Gain basic knowledge in genetic engineering.													
CO5	Design and develop new technologies in genetic industrial field.													
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							
CO2	3						2							
CO3	3						2							
CO4	3						2							
CO5	3						2							

Syllabus		
UNIT NO	Contents	Mapped POS
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
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Learning Resources

Text Books

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| <ol style="list-style-type: none"> 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. |
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Reference Books

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| <ol style="list-style-type: none"> 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 Wiley and Sons, 2009. 3. John Enderle and Joseph Bronzino Introduction to Biomedical Engineering, 3/e, 2012. |
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