

LIFE SCIENCES FOR ENGINEERS

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| Course Code | 19BS1303 | Year | II | Semester | I |
| Course Category | Basic Sciences | Branch | CE | 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

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| 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 | | | | | | | |

| 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 | CO1 |

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| | Recombinant vaccines, transgenic microbes, plants and animals. Animal cloning, biosensors, biochips. | CO4 CO5 |
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| Learning Recourses |
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| 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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