Life Sciences for Engineers

Course Code	20MC1101	**Year**	I	**Semester**	I
Course Category	Mandatory	**Branch**	ECE	**Course Type**	Theory
Credits	0	**L-T-P**	2-0-2	**Prerequisites**	Nil
Continuous Internal Evaluation	30	**Semester End Evaluation**	70	**Total Marks**	100

Course Outcomes

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

CO1	Apply the concepts of biology to create tangible and economically viable engineering goods.((L3)
CO2	Analyse new technologies in Genetics biotechnology, pharmaceutical, medical and agricultural fields from the knowledge gained from DNA technology.(L4)
CO3	Apply the knowledge of biology to improve the living standards of societies.(L3)
CO4	Apply the basic knowledge of genetics and DNA technology for disease diagnostics and therapy.(L3)
CO5	Analyse new technologies in biotechnology, pharmaceutical, medical and agricultural fields from the knowledge gained from DNA technology.(L4)

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	3				2				
CO5	3					3				2				
Avg.					3	3				2				

Unit No.	Syllabus	Mapped CO's
1	**Introduction to Biology** Comparison of Biological organisms with manmade systems :Eye and Camera, Flying bird and Aircraft Ultra structure of cell: Prokaryotes and Eukaryotes	CO1
2	**Bio-molecules** Structure and functions of proteins (antibodies) Structure and functions of nucleic acids Industrial applications- Enzymes and Fermentation	CO1 CO2
3	**Bioenergetics and Cellular Respiration** Mechanism of photosynthesis Glycolysis TCA cycle Electron transport chain and Oxidative phosphorylation.	CO3

4	**Genetics** Mendel'slaws Gene mapping Single gene disorders in humans	CO3 CO4
5	**Recombinant DNA Technology** Recombinant vaccines, transgenic microbes, plants and animals. Animal cloning, biosensors, biochips.	CO2 CO5
Expt. No.	**Name of the experiment**	**Mapped CO's**
1	Dissect & mount different parts of plants using Microscope	CO1
2	Estimation of Proteins by using Biuret method	CO2
3	Estimation of enzyme activity.	CO2
4	Estimation of chlorophyll content in some selected plants.	CO3
5	Nitrogen Cycle: Estimation of Nitrates /Nitrites in soil by using Spectrophotometer	CO3
6	Mendal's laws and gene mapping	CO4, CO5

Learning Resources

Text Books

1. Biology for Engineers-Wiley Editorial
2. N. A. Campbell, J. B. Reece, L. Urry, M. L. Cain and S. A. Wasserman, "Biology: A global approach", Pearson Education Ltd, 2018.
3. U.Satyanarayana, Biotechnology Alliedand books Pvt. ltd. Kolkata

Reference Books

1. Alberts et al., The molecular biology of the cell, 6th Ed., Garland Science, 2014.
2. John Enderle and Joseph Bronzino, Introduction to Biomedical Engineering, 3rd Ed., 2012