Life Sciences for Engineers

Course Code	20MC1201	**Year**	I	**Semester**	II
Course Category	Mandatory	**Branch**	IT	**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			1	
CO2					3					2			1	
CO3					3					2			1	
CO4					3	3				2			1	
CO5	3					3				2			1	

Syllabus

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 photosynthesisGlycolysis 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. Biotechnology by U.Satyanarayana, Alliedand books Pvt. ltd. Kolkata

Reference Books

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