PROGRMA OUTCOME (PO), PROGRAM SPECIFIC OUTCOME (PSO) AND COURSE OUTCOME (CO)
B.Sc. Biotechnology (under CBCS)

NAME OF PROGRAM	PROGRAM OUTCOME	PROGRAM SPECIFIC OUTCOME	COURSE DETAILS	COURSE OUTCOME
B.Sc. (Biotechnology)	The students will have the basic knowledge of Biotechnology and its applications	After graduation, the students shall be able to pursue postgraduate degree, get industry jobs and prepare for various competitive exams for Govt. jobs	**I Semester** S0LS/BBT/C 0001 Cell Biology & Genetics	Basic knowledge of cell organelles, Knowledge of how basic life unit functions and laws of inheritance and basic genetics
			I Semester S0LS/BBT/C 0002 Lab course based on C0001	Knowledge about the laboratory practicals related to Cell Biology & Genetics
			II Semester S0LS/BBT/C 0003 Biochemistry & Metabolism	Knowledge of Bio molecules and their functions.
			II Semester S0LS/BBT/C 0004 Lab course based on C0003	Knowledge about the laboratory practicals related to Biochemistry & Metabolism
			III Semester S0LS/BBT/C0005 Microbiology & Immunology	Knowledge on various basic aspects of Microbiology and Immunology
			III Semester S0LS/BBT/SE001a Cell culture and applications	Skill enhancement in the area of animal cell culture and plant tissue culture techniques
			III Semester S0LS/BBT/SE001b Biological Tools & Techniques	Skill enhancement regarding various tools and techniques used in biological sciences.
			III Semester S0LS/BBT/C 0006 Lab course based on C0005	Knowledge about the laboratory practicals related to Microbiology and Immunology
			IV Semester S0LS/BBT/C 0007	Fundamental knowledge of Molecular Biology and

			Molecular Biology & Recombinant DNA Technology	Recombinant DNA Technology
			IV Semester S0LS/BBT/SE002a Bioethics, Bio-safety & Human Welfare	Skill enhancement by developing the understanding of Bioethics and Biosafety and their importance in human welfare.
			IV Semester S0LS/BBT/SE002b Molecular Diagnostics	Skill enhancement by developing the understanding of various molecular techniques and diagnostic methods
			IV Semester S0LS/BBT/C0008 Lab course based on C0007	Knowledge about laboratory practicals related to Molecular Biology and Recombinant DNA Technology
			V Semester S0LS/BBT/DSE01a Virology & Vaccine Development	Fundamental as well as advanced knowledge of viruses, vital infections and basic understanding about vaccine development
			V Semester S0LS/BBT/DSE01b Animal Biotechnology	Basic knowledge of Animal Biotechnology and its applications
			V Semester S0LS/BBT/DSE01c Biostatistics and Basic Bioinformatics	Basic understanding of various methods and techniques of Bioinformatics and Biostatistics.
			V Semester S0LS/BBT/SE003a Intellectual Property Rights & Patenting	Skill enhancement by developing understanding of the issues related to IPR and Patenting methods and their growing importance in Biotechnology
			V Semester S0LS/BBT/SE003b Environmental Biotechnology	Skill enhancement by understanding the various components of environment, pollution and biotechnological solution.
			V Semester S0LS/BBT/DSE02 Lab Course based on DSE01	Knowledge about laboratory practicals related to DSE 01 course

			VI Semester S0LS/BBT/DSE03a Medical Microbiology	Fundamental knowledge of Medical Microbiology and its relevance.
			VI Semester S0LS/BBT/DSE03b Plant Biotechnology	Conceptual knowledge of theoretical and practical aspects of Plant Biotechnology
			VI Semester S0LS/BBT/DSE03c Basics of Forensic Science	Knowledge about basics of forensic science and applications
			VI Semester S0LS/BBT/SE004a Bioprocess Technology	Basic understanding of Bioprocess, product formation and recovery
			VI Semester S0LS/BBT/SE004b Enzymology	Fundamental knowledge of enzymes, their action and applications
			VI Semester S0LS/BBT/DSE04 Lab Course based on DSE03	Knowledge about laboratory practical related to DSE03 course

PROGRMA OUTCOME (PO), PROGRAM SPECIFIC OUTCOME (PSO) AND COURSE OUTCOME (CO)

B.Sc. Biotechnology (under NEP)

NAME OF PROGRAM	PROGRAM OUTCOME	PROGRAM SPECIFIC OUTCOME	COURSE DETAILS	COURSE OUTCOME
B.Sc. (Biotechnology)	The students will have the basic knowledge of Biotechnology and its applications	After completing the course the students shall be able to get jobs in the area of Biotechnology or related fields. They can also go for higher studies or prepare for various competitive exams.	**I Semester** CBT-1 Introductory Biotechnology	Theoretical and practical knowledge of basics of biotechnology
			I Semester AID-BT-1 Introductory Biotechnology	Fundamental knowledge of biotechnology
			I Semester SEC-BT-1 Cell and Tissue culture	Basic knowledge about tissue culture techniques and development of

				practical understanding of the subject
			II Semester CBT-2 Biomolecules	Basic knowledge about various biological macromolecules, their functions and practical analysis
			II Semester AID-BT-2 Biomolecules	Basic knowledge about various biological macromolecules.
			II Semester Sec-BT-2 Enzymology	Theoretical and practical understanding of enzymes, their types. functions and applications
			III Semester CBT-3 Elementary Microbiology	Basic knowledge about various types of microorganisms and techniques related to their cultivation and analysis
			III Semester AID-BT-3 Elementary Microbiology	Basic knowledge about various types of microorganisms
			III Semester SEC-BT-3 Food Biotechnology	Theoretical and practical knowledge of fermented food production, food related disease, hygiene and biotechnological interventions
			IV Semester CBT-4 Basics of Molecular Biology	Fundamental knowledge of gene expression and practical skills for isolation and analysis of genetic material.
			IV Semester AID-BT-4 Basics of Molecular Biology	Basic knowledge of DNA, RNA and Proteins and their generation
			IV Semester Sec-BT-4 Molecular Diagnostics	Theoretical and practical understanding of Molecular Diagnostic methods.

PROGRMA OUTCOME (PO), PROGRAM SPECIFIC OUTCOME (PSO) AND COURSE OUTCOME (CO)
M.Sc. Biotechnology (under CBCS)

NAME OF PROGRAM	PROGRAM OUTCOME	PROGRAM SPECIFIC OUTCOME	COURSE DEATILS	COURSE OUTCOME
M.Sc. (Biotechnology)	The students will have the advanced knowledge of the core principles and topics of Modern day Biotechnological methods and applications.	M.Sc. Biotechnology students are specifically trained for basic as well as applied research and industrial requirement. It is also the basic requirement for Higher Studies like Ph.D.	**1st Semester** 1. Biochemistry (S0LS/MBT/C 0001) 2. Cell Biology & Membrane Biophysics (S0LS/MBT/C 0002) 3. Molecular Biology & Genetics (S0LS/MBT/C 0003) 4. Bio-Analytical Techniques (S0LS/MBT/C 0004) 5. Lab Course based on course C0001 & C0002 (SOLS/MBT/C0005) 6. Lab Course based on course C0003 & C0004 (SOLS/MBT/C0006)	1. Knowledge about the structure, function and metabolism of various biomolecules 2. Information about the structure and functions of cell, its organelles and membrane components 3. Understanding of genes, steps of gene expression and principles of heredity. 4. Knowledge about various tools and techniques used in the field of Biotechnology 5. Hands on laboratory experiments based on courses (S0LS/MBT/C 0001) & (S0LS/MBT/C 0002) 6. Hands on laboratory experiments based on courses (S0LS/MBT/C 0003) & (S0LS/MBT/C 0004)
			2nd Semester 7. Immunology (SOLS/MBT/C 0007) 8. Microbiology & Microbial Genetics (S0LS/MBT/C0008) 9. Genetic Engineering & Applications (S0LS/MBT/C 0009)	7. Knowledge about immune system and immune responses. 8. Conceptual knowledge of microorganisms and understanding about their genetics. 9. Understanding the principals, process and applications of genetic engineering

			10. Biostatistics & Bioinformatics (S0LS/MBT/C0010) 11. Lab Course based on course C0007 & C0008 (SOLS/MBT/C0011 12. Lab Course based on course C0009 & C0010 (SOLS/MBT/C0012) 13. Epigenetics & Cancer Biology (SOLS/MBT/SS001) 14. Biomedical Technology (SOLS/MBT/SS002)	10. Knowledge about the concepts of Biostatistics and Bioinformatics 11. Knowledge about the laboratory practicals related to Immunology and Microbiology & Microbial Genetics 12. Knowledge about the laboratory practicals related to Genetic Engineering and Biostatistics & Bioinformatics. 13. Self-learning of the concepts of Epigenetics & Cancer Biology 14. Self-learning of the concepts of Biomedical Technology
			3rd Semester 15. Plant Biotechnology (S0LS/MBT/C 0013) 16. Intellectual Property rights, Bioethics, Bio-Entrepreneurship (S0LS/MBT/C 0014) 17. Lab course based on course C0013 & C0014 (SOLS/MBT/C0015) 18. (i) SOLS/MBT/E0001a Protein Engineering	15. Fundamental as well as advanced knowledge of Biotechnology using plants and genetic engineering 16. Understating of the issues like IPR, Patenting & Bioethics and their importance in Biotechnology. Also the basic knowledge of Bio-Entrepreneurship. 17. Knowledge about the laboratory practicals based on course C0013 & C0014 18. (i) Fundamental as well as advanced knowledge of the protein building molecules and their

				engineering for various applications.
			(ii) SOLS/MBT/E0001b Immunotechnology	(ii) Fundamental as well as advanced knowledge in the area of Immunotechnology.
			(iii) SOLS/MBT/E0001c Nanobiotechnology	(iii)Knowledge about nanotechnology and applications in biological sciences.
			19. (i) SOLS/MBT/E0002a Food & Beverages Biotechnology (ii) SOLS/MBT/E0002b Animal Biotechnology (iii) SOLS/MBT/E0002c Enzymology & Enzyme Technology	19. (i) Knowledge about the biotechnological products and applications in Food & Beverages industry (ii) Fundamental as well as advanced knowledge of the principles and applications of Animal Biotechnology. (iii) Knowledge about properties, kinetics, inhibition and mechanism of enzyme action
			20. SOLS/MBT/E0003 Lab Course based on course E0001 & E0002	20. Knowledge about the laboratory practicals based on courses E0001 & E0002
			21. Research Methodology: Tools & Techniques (SOLS/MBT/SS003)	21. The students will learn about the importance of Research methodology and its use in biological research
			22. Science Communication & Scientific Writing (SOLS/MBT/SS004)	22. Development of scientific temper and skills of scientific writing and presentation

			4th semester 23. Environmental Biotechnology (S0LS/MBT/C 0016) 24. Fermentation & Bioprocess Technology (S0LS/MBT/C 0017) 25. Lab Course based on course C0016 & C0017 26. (i) Advanced Bioinformatics (SOLS/MBT/E0004 a) (ii) Herbal Biotechnology (SOLS/MBT/E000 4b) (iii) Genomics & Proteomics (SOLS/MBT/E0004c) 27. Dissertation (SOLS/MBT/E0005) 28. Vaccines & Drug Development (SOLS/MBT/SS005) 29. Molecular Virology (SOLS/MBT/SS006)	23. Knowledge of biotechnological innovations towards solution of environmental issues. 24. Knowledge of fermentation and bioprocesses and product recovery. 25. Training on laboratory experiments in the area of Environmental Biotechnology and Fermentation & Bioprocess Technology. 26. (i) Knowledge of advance tools of bioinformatics and its applications (ii)Learning of the use of medicinal plants ant their biotechnological applications (iii) Knowledge of the concepts and applications of genomics and proteomics 27. Hand on experience on doing a research project 28. Self-learning of the concepts of Vaccines and Drug development 29. Self-learning of the concepts of Molecular Virology