

**M.S. RAMAIAH COLLEGE OF ARTS, SCIENCE AND COMMERCE**

**Course Outcomes for Bsc(Bio/Chem/MB)Program**

<b>Program</b>	<b>CourseCode</b>	<b>CourseName</b>	<b>COCode</b>	<b>CO</b>
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT101	Cell Biology & Genetics	CO1	Journey of a cell - cell theory, cell division and cell death
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT101	Cell Biology & Genetics	CO2	Description of cell organelles
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT101	Cell Biology & Genetics	CO3	Understand the nature & significance of Genetic material & concepts of Genetics
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT101	Cell Biology & Genetics	CO4	Deviations in concepts of genetics
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT101	Cell Biology & Genetics	CO5	Understand Chromosomal variations, mapping, evolution, mutations & Cytoplasmic inheritance
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C1S	Chemistry-I	CO5	To study the properties of gases
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C1S	Chemistry-I	CO6	To know about Periodic Table, Classification, physical and chemical properties.
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C1S	Chemistry-I	CO7	To know the factors affecting I.P, EA, EN & the diagonal relationship between Be & Al.
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C1S	Chemistry-I	CO8	Comparative study of Chalcogens and halogens w.r.t Electronic Configuration, Atomic radii, Ionic radii etc.
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C1S	Chemistry-I	CO9	To study Halides, oxides and carbonates of alkali and alkaline earth metals.
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C1S	Chemistry-I	CO10	Introduction, Types, minimization of determinate errors, accuracy and precision.
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C1S	Chemistry-I	CO11	To study Equivalent weights of acids, bases, salts, oxidizing and reducing agents.

B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C1S	Chemistry-I	CO12	To understand Significant figures and their computations, Normality and Molarity. Numerical problems.
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C1S	Chemistry-I	CO13	Definition and explanation for homolytic and heterolytic cleavage. Explanation for electrophilic and nucleophilic Reagents.
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C1S	Chemistry-I	CO14	Types of reactions - addition, substitution and elimination. Definition & explanation for different types of isomers. Brief explanation for chiral centre and Tautomerism.
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C1S	Chemistry-I	CO15	Nomenclature of branched chain alkanes, preparation of symmetrical unsymmetrical alkanes. explanation of Corey- House reaction and Wurtz reaction - their merits and demerits.
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C1S	Chemistry-I	CO16	Conformational analysis of n-butane - Sawhorse & Newman projection formulae to be used -Energy profile diagram
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C1S	Chemistry-I	CO17	Deliberate in details with examples Alkanes, Alkenes, Alkynes, Cycloalkanes and Dienes
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C1S	Chemistry-I	CO1	To understand the basic interaction of molecule with light
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C1S	Chemistry-I	CO2	To study the basic principles and applications of photochemical reactions
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C1S	Chemistry-I	CO3	To study the properties of Liquids and solutions
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C1S	Chemistry-I	CO4	Applications of Distribution Laws for liquids
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C1S	Chemistry-I	CO20	Learn the details of Photochemistry
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C1S	Chemistry-I	CO21	Specify the classification and characteristics of Liquids and Solutions
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C1S	Chemistry-I	CO22	Understand in depth Periodic Table and Periodic properties
B.Sc (Biotechnology)	SC1C1S	Chemistry-I	CO23	Specify the details of Analytical Chemistry

	/ Chemistry/ Microbiology)				
	B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C1S	Chemistry-I	CO24	Understand the classification and characteristics of Basic concepts in organic chemistry
	B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C1S	Chemistry-I	CO25	Learn the characteristics of Aliphatic Hydrocarbons
	B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C1S	Chemistry-I	CO26	Understand in details with application, if applicable, Aliphatic Hydrocarbons
	B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C1S	Chemistry-I	CO18	Learn in details with application, if applicable, Mathematical Concepts for Chemistry
	B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C1S	Chemistry-I	CO19	Identify the characteristics of Gaseous state
	B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT101	Basic Microbiology	CO4	Definition of antibiotic, classification of antimicrobial drugs and their mode of action with suitable example.
	B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT101	Basic Microbiology	CO5	Principle and applications of analytical instruments- Centrifuge, Ultracentrifuge, Spectrophotometer and Chromatography techniques.
	B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT101	Basic Microbiology	CO6	Definition of Sterilization, methods of sterilization and mode of action of physical and chemical agents as sterilizing agents.
	B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT101	Basic Microbiology	CO1	Unit 1: Introduction, History and Scope of Microbiology- Students will be able to discover the microbial world, origin of life on earth, the basic and applied aspects of microbiology as modern science, controversy over spontaneous generation, contributions of different scientists for microbiology
	B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT101	Basic Microbiology	CO2	Microscopy- students will be able to understand basic principles of microscopy (resolution, magnification, numerical aperture and working distance). They will also be learning about a special technique called photomicrography, that is the fixing of DSLR camera to a normal microscope. They will be studying about differences between light and electron microscope. Working principle, construction and applications of different types of microscope is dealt. Light microscope include, bright field, dark field, fluorescence, phase contrast microscope. Electron microscopes include Scanning Electron

					Microscope (SEM) and Transmission Electron Microscope (TEM).
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT101	Basic Microbiology	CO3		Students will be able to know about nature of dyes, Physical and chemical theories of staining. Principle, procedure and applications of two different staining techniques like simple staining and differential staining techniques a) Simple staining includes negative and positive staining b) Differential staining includes Grams and acid fast staining c) Structural staining includes cell wall, endospore, flagella and capsular staining techniques
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT201	General Microbiology & Biostatistics	CO2		Importance of sterilization and its applications
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT201	General Microbiology & Biostatistics	CO3		Knowledge on structure, physiology & classification of microorganisms
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT201	General Microbiology & Biostatistics	CO4		understand the epidemiology, mechanism, symptoms & treatment of important human diseases
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT201	General Microbiology & Biostatistics	CO1		Knowledge on principle & construction of different types of microscopes
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT201	General Microbiology & Biostatistics	CO5		Application of statistics in biology
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C2S	Chemistry-II	CO5		Specify in depth Silicates
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C2S	Chemistry-II	CO6		Identify in depth Noble gases
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C2S	Chemistry-II	CO7		Understand in depth General study of d and f block elements.
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C2S	Chemistry-II	CO4		Learn the details of Aromatic hydrocarbons
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C2S	Chemistry-II	CO1		To learn the theories of chemical bonding of molecules
B.Sc (Biotechnology / Chemistry/	SC1C2S	Chemistry-II	CO2		To understand the basics of quantum chemistry

	Microbiology)				
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C2S	Chemistry-II	CO3	To learn characteristic features of d- and f-block elements	
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1P2S	Chemistry practical-II	CO1	To learn the basics of physical chemistry experiments	
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1P2S	Chemistry practical-II	CO2	To learn handling of equipments and analyse the data	
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1P2S	Chemistry practical-II	CO1	To learn and Understand the Physical Properties Like Density, Viscosity and Surface tension of Different Liquids	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT201	Microbial Taxonomy & Culture Techniques	CO1	Unit 1 The Microbial World- The study of various groups of microorganisms	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT201	Microbial Taxonomy & Culture Techniques	CO2	Unit 2 Culturing of microorganisms	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT201	Microbial Taxonomy & Culture Techniques	CO3	Unit 3 Microbial growth	
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT301	Biological chemistry	CO4	To understand and apply biophysical and analytical techniques	
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT301	Biological chemistry	CO5	To apply the applications of spectroscopic and isotope techniques	
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT301	Biological chemistry	CO1	The course is intended to make the student understand the structures and functions of biomolecules.	
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT301	Biological chemistry	CO2	Identify in details with examples Biotechnology	
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT301	Biological chemistry	CO3	Identify the characteristics of Biological chemistry	
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTP302	Biological chemistry		Students are able to understand the importance of biomolecules with reference to their properties and functions in the living system.	

B.Sc (Biotechnology / Chemistry/ Microbiology)	SC3C3S	Chemistry-III	CO5	Identify the characteristics of Chemical Kinetics
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC3C3S	Chemistry-III	CO6	Write down in details with examples Chem Thermodynamics lical Kinetics
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC3C3S	Chemistry-III	CO7	Understand in details with examples Thermodynamics II
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC3C3S	Chemistry-III	CO8	Identify in details with examples Surface chemistry
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC3C3S	Chemistry-III	CO9	Specify in details with application, if applicable, Organic and Inorganic Polymers
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC3C3S	Chemistry-III	CO12	Identify in details with examples Organometallic compounds
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC3C3S	Chemistry-III	CO10	Write down in depth Ethers and Epoxides
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC3C3S	Chemistry-III	CO11	Deliberate the characteristics of Fertilizers
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC3C3S	Chemistry-III	CO10	Identify in details with application, if applicable, Compounds of some Nonmetals
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC3C3S	Chemistry-III	CO11	Write down the classification and characteristics of Metallurgy
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC3C3S	Chemistry-III	CO8	Identify the characteristics of Alcohols and Thiols
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC3C3S	Chemistry-III	CO9	Identify in depth Phenols
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC3P3S	Chemistry practical-III	CO8	Identify in details with application, if applicable, Alcohols and Thiols
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC3P3S	Chemistry practical-III	CO9	Understand in details with examples Ethers and Epoxides

	Microbiology)				
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC3P3S	Chemistry practical-III	CO5	Specify in details with application, if applicable, Thermodynamics I and II	
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC3P3S	Chemistry practical-III	CO4	Deliberate in depth Chemical Kinetics	
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC3P3S	Chemistry practical-III	CO7	Deliberate in details with application, if applicable, Surface chemistry	
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC3P3S	Chemistry practical-III	CO1	To have basic practical skills for the synthesis and analysis of organic compounds	
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC3P3S	Chemistry practical-III	CO2	To know and recall the fundamental principles of organic chemistry	
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC3P3S	Chemistry practical-III	CO3	to make capable to describe the method of chromatography and its applications	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT301	Microbial Physiology &Microbial Genetics	CO1	Understanding enzymes in detail with its properties and applications	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT301	Microbial Physiology &Microbial Genetics	CO2	knowing the classification, characteristics and structure of Nucleic acids	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT301	Microbial Physiology &Microbial Genetics	CO3	Understanding of Genome organization and detailed process of DNA replication in prokaryotes and eukaryotes	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT301	Microbial Physiology &Microbial Genetics	CO4	Learn in details with examples about Genetic recombination and transposable elements in Bacteria	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT301	Microbial Physiology &Microbial Genetics	CO5	Study of Mutagenic agents, types of Mutations, Mutation detection techniques and its applications	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT301	Microbial Physiology &Microbial Genetics	CO6	understanding biomolecules and bioenergetics	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT301	Microbial Physiology &Microbial Genetics	CO7	Learning Oxidation reduction reaction and energy yielding pathways	

B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT301	Microbial Physiology &Microbial Genetics	CO8	understanding bacterial photosynthesis
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBP302	Microbial Physiology &Microbial Genetics	CO2	Understand in details with application, if applicable, dna replication
B.Sc (Biotechnology / Chemistry/ Microbiology)	ENG4S4	General English	CO1	DEVELOPING INDIVIDUAL IDENTITY
B.Sc (Biotechnology / Chemistry/ Microbiology)	ENG4S4	General English	CO2	Identify the classification and characteristics of FDSGHDFWJHGE
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT401	Molecular biology	CO1	Understand the basic concepts of nucleic acids
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT401	Molecular biology	CO2	knowledge on central dogma of Molecular biology
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT401	Molecular biology	CO3	Understand the gene organization, expression & regulation in Prokaryotes & Eukaryotes
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT401	Molecular biology	CO4	genetic recombination mechanism
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT401	Molecular biology	CO5	Transposable elements & its significance
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC4C4S	Chemistry-IV	CO3	Learning and Understanding the Nuclear and Radiochemistry
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC4C4S	Chemistry-IV	CO8	Learn in depth Steel
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC4C4S	Chemistry-IV	CO9	Deliberate the details of Aldehydes and Ketones
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC4C4S	Chemistry-IV	CO10	Write down in depth Carboxylic acids and their derivatives.
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC4C4S	Chemistry-IV	CO11	Write down the details of Tautomerism and Enolates



	Microbiology)				
	B.Sc (Biotechnology / Chemistry/ Microbiology)	SC4C4S	Chemistry-IV	CO12	Identify the characteristics of Environmental Chemistry
	B.Sc (Biotechnology / Chemistry/ Microbiology)	SC4C4S	Chemistry-IV	CO6	Deliberate in depth Aldehydes and ketones
	B.Sc (Biotechnology / Chemistry/ Microbiology)	SC4C4S	Chemistry-IV	CO1	Understanding the structure of Solids
	B.Sc (Biotechnology / Chemistry/ Microbiology)	SC4C4S	Chemistry-IV	CO2	Understanding the Phase rule and its Applications
	B.Sc (Biotechnology / Chemistry/ Microbiology)	SC4C4S	Chemistry-IV	CO1	Properties and applications of various steels
	B.Sc (Biotechnology / Chemistry/ Microbiology)	SC4C4S	Chemistry-IV	CO2	Condensation reactions and their mechanism
	B.Sc (Biotechnology / Chemistry/ Microbiology)	SC4C4S	Chemistry-IV	CO3	Synthesis and important reactions of aldehydes and ketones
	B.Sc (Biotechnology / Chemistry/ Microbiology)	SC4P4S	Chemistry practical-IV	CO1	Understanding the Analysis of Inorganic Saltmixures
	B.Sc (Biotechnology / Chemistry/ Microbiology)	SC4P4S	Chemistry practical-IV	CO2	To learn how to analyse the salt mixture through a systematic analytical procedure
	B.Sc (Biotechnology / Chemistry/ Microbiology)	SC4P4S	Chemistry practical-IV	CO3	To understand the concept of qualitative analysis
	B.Sc (Biotechnology / Chemistry/ Microbiology)	SC4P4S	Chemistry practical-IV	CO4	To determine the acid and base radicals by preliminary and confirmatory chemical tests
	B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT401	Molecular Biology & Recombinant DNA Technology	CO23	Study of gene regulation in prokaryotes
	B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT401	Molecular Biology & Recombinant DNA	CO24	Knowing the details of DNA manipulative enzymes and vectors used in RDT

			Technology		
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT401	Molecular Biology & Recombinant DNA Technology	CO25	Understanding the construction and transformation of r DNA molecule and study of screening techniques	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT401	Molecular Biology & Recombinant DNA Technology	CO26	Study of molecular techniques and applications and hazards of genetic engineering	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT401	Molecular Biology & Recombinant DNA Technology	CO21	Understanding the types and functions of RNA molecules	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT401	Molecular Biology & Recombinant DNA Technology	CO22	understanding the gene expression-mechanism of transcription and translation in prokaryotes	
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT501	Genetic Engineering & Environ. Biotechnology	CO3	To remember the basics of Screening and selection of recombinant host cells and apply construction of gene libraries, Molecular biology techniques	
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT501	Genetic Engineering & Environ. Biotechnology	CO5	Analyse and understand the technology of bioremediation, treatment of municipal waste, industrial effluents, biofertilizers and bioleaching.	
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT501	Genetic Engineering & Environ. Biotechnology	CO4	Understand Renewable, Non-Renewable resources of energy, Conventional fuels and Modern fuels.	
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT501	Genetic Engineering & Environ. Biotechnology	CO1	To understand the concepts of Genetic Engineering and its tools.	
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT501	Genetic Engineering & Environ. Biotechnology	CO2	Apply the basics of In Vitro construction of recombinant DNA molecules and Transformation of r-DNA	
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT502	Immunology & Animal Biotechnology	CO1	Understand the details of immunology	
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT502	Immunology & Animal Biotechnology	CO2	Learn the details of animal biotechnology	
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTP503	Genetic Engineering & Environ. Biotechnology	CO1	Deliberate in depth calculation of income tax	

B.Sc (Biotechnology / Chemistry/ Microbiology)	BTP503	Genetic Engineering & Environ. Biotechnology	CO2	Specify the details of genetic engg
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTP504	Immunology & Animal Biotechnology	CO2	Types of Vaccination and immunization
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTP504	Immunology & Animal Biotechnology	CO3	To understand the scope of animal cell culture and different methods employed in culture of animal cells
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTP504	Immunology & Animal Biotechnology	CO4	To learn the expression of cloned proteins in animal cells and methods of growth factors, antibodies and vaccines production
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTP504	Immunology & Animal Biotechnology	CO5	To understand the different techniques in transgenic animal production
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTP504	Immunology & Animal Biotechnology	CO1	To study the history of Immunology, types of immunity, interaction of Ag-Ab and hypersensitivity reactions
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C51	Chemistry-V	CO1	Learning the synthesis and structural elucidation of citral,Zingiberene and nicotine
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C51	Chemistry-V	CO2	Deliberate in depth definition,classification,structures and impotances of terpenes and alkaloids
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C51	Chemistry-V	CO3	Learn the details of classification, preparation,properties.basicity and synthetic applications of amines
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C51	Chemistry-V	CO4	Understanding of Heterocyclic compounds in detail
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C51	Chemistry-V	CO5	structure elucidation of organic compounds using spectroscopic techniques
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C52	Chemistry-VI	CO1	Deliberate the details of Electrochemistry I
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C52	Chemistry-VI	CO2	Deliberate in details with application, if applicable, Electrochemistry II
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C52	Chemistry-VI	CO4	Deliberate in depth Physical properties and Molecular structures

	Microbiology)				
	B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C52	Chemistry-VI	CO5	Specify in details with application, if applicable, Chemical Spectroscopy I
	B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C52	Chemistry-VI	CO6	Write down in details with application, if applicable, Chemical Spectroscopy II
	B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C52	Chemistry-VI	CO7	Identify the classification and characteristics of Electroanalytical Methods
	B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C52	Chemistry-VI	CO3	Deliberate in depth Ionic equilibria
	B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1P51	Chemistry practical-V	CO1	To develop skills in doing experiments and handling instruments
	B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1P51	Chemistry practical-V	CO2	To provide the fundamental concepts of physical chemistry lab
	B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1P51	Chemistry practical-V	CO3	To skill in solving problems, critical thinking and analytical reasoning
	B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1P52	Chemistry practical-VI	CO1	To get the practical knowledge about physical chemistry experiments.
	B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1P52	Chemistry practical-VI	CO2	Learning various titrimetric methods
	B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1P52	Chemistry practical-VI	CO3	Skill development to make the reagents and solutions for lab
	B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT501	Agricultural &Environment Microbiology	CO1	Significance of soil and soil microbiology, soil structure and microorganisms found in soil. Details of different microbes- their role and characteristics (bacteria, fungi, actinomycetes, viruses, protozoans, algae) .
	B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT501	Agricultural &Environment Microbiology	CO2	Different microbes having positive or negative impact in agriculture. Types of interactions of microbes with plants. Role of microorganisms in different biogeochemical cycles. Different microbes acting as biofertilizers and biopesticides- mechanism and merits. Biodegradation of xenobiotic compounds and natural polymers. Phytopathogens -

					symptoms, host and control measures.
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT502	Food & Dairy Microbiology	CO1	PRACTICAL-Food Microbiology-Ø Understand the principles of microorganisms during various food-processing and preservation steps. Ø Comprehend the interactions between microorganisms and the food environment, and factors influencing their growth and survival. Ø Understand the significance and activities of microorganisms in food. Ø Recognize the characteristics of food-borne, waterborne and spoilage microorganisms, and methods for their isolation, detection and identification. Ø Analyze the importance of microbiological quality control programme's in food production. Ø Discuss the microbiology of different types of food commodities Dairy-Quality analysis of Milk like MBRT, SPC, DMC. Estimation of lactose and fat content in milk.	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBP504	Food & Dairy Microbiology	CO2	Specify in depth Food and microorganisms, food spoilage, food poisoning, food preservation, microbial examination of food, microorganisms as food	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBP504	Food & Dairy Microbiology	CO2	Milk composition, Milk sterilization, Microbial analysis of milk, pasteurization, Sterilization and Dehydration, Yogurt and cheese production, Prebiotics and Probiotics, Lactic acid fermentation, Colour and Flavour- milk fermentation, Proteolysis	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBP504	Food & Dairy Microbiology	CO3	Microorganisms and Milk Physical and chemical properties of milk. Milk as a substrate for microorganisms. Types of microorganisms in Milk -bacteria, fungi and yeast. Sources of microbial contamination of milk -milch animal, utensils and equipment, water, milking environment,- personnel and packaging material.	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBP504	Food & Dairy Microbiology	CO4	Microbiological analysis of milk Rapid platform tests -organoleptic, Clot on boiling (COB), titratable acidity, alcohol test, DMC, sedimentation test and pH. Standard plate count, reductase test -MBRT, Resazurin test	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBP504	Food & Dairy Microbiology	CO5	Methods of preservation of milk and milk products Pasteurization, sterilization and dehydration An account of condensed and dried milk	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBP504	Food & Dairy Microbiology	CO6	Fermentation in milk Souring, lactic acid fermentation, colour and flavour fermentation, gassy fermentation and proteolysis.	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBP504	Food & Dairy Microbiology	CO7	Fermented Milk Products Yogurt -Types & production Cheese -types and production - Cheddar & Cottage Cultured Butter milk.	

	Microbiology)				Genetic engineering and Dairy industry
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT602	Industrial Biotechnology	CO1	Learn in details with application, if applicable, To know the concepts of industrial Biotechnology and fermentation technology.	
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT602	Industrial Biotechnology	CO2	Specify the classification and characteristics of To remember the basics of Screening, Isolation, maintenance of strains and Types of fermentation and fermenters.	
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT602	Industrial Biotechnology	CO3	Apply the basics of Process Development and Production of Microbial products	
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT602	Industrial Biotechnology	CO4	Apply Enzyme Biotechnology and analyse Fermented foods.	
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTT602	Industrial Biotechnology	CO5	Understand the technique of mass culture and apply culture methods for Algae and microbial polysaccharides.	
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTP603	Plant Biotechnology	CO3	Developing concepts in Biotechnology and Intellectual Property Rights (IPR)	
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTP603	Plant Biotechnology	CO4	Production of edible vaccines	
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTP603	Plant Biotechnology	CO5	Role of tissue culture in agriculture, horticulture and forestry	
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTP603	Plant Biotechnology	CO1	To understand the basics of various invitro methods in plant biotechnology	
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTP603	Plant Biotechnology	CO2	To learn the tranformation techniques involved in transgenic plant production	
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTP604	Industrial Biotechnology	CO1	To know the concepts of industrial Biotechnology and fermentation technology.	
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTP604	Industrial Biotechnology	CO2	To remember the basics of Screening, Isolation, Maintenance of strains and Types of fermentation and Fermenters.	
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTP604	Industrial Biotechnology	CO3	Identify in details with examples the basics of Process Development and Production of Microbial products	

B.Sc (Biotechnology / Chemistry/ Microbiology)	BTP604	Industrial Biotechnology	CO4	Understand the classification and characteristics of applied enzyme biotechnology and analyse fermented foods.
B.Sc (Biotechnology / Chemistry/ Microbiology)	BTP604	Industrial Biotechnology	CO5	Understand the technique of mass culture and its application in production of algal and microbial polysaccharides
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C61	Chemistry-VII	CO1	To understand the chemistry of coordination compounds and their biological importance
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C61	Chemistry-VII	CO2	To learn the types and applications of industrial materials
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C61	Chemistry-VII	CO4	To learn about the organometallic compounds and their structure
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C61	Chemistry-VII	CO3	To introduce the newer materials in chemistry and to discuss their properties and relevance
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C62	Chemistry-VIII	CO2	Knowledge on metabolism of carbohydrates, lipids and proteins.
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C62	Chemistry-VIII	CO1	Understanding of Carbohydrates, lipids, proteins with examples
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C62	Chemistry-VIII	CO3	Understand the principle, procedure and applications of Biochemical Techniques
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C62	Chemistry-VIII	CO4	Knowledge on Nucleic acids and enzymes
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1C62	Chemistry-VIII	CO5	understanding of molecular biology
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1P62	Chemistry practical VIII	CO1	To estimate particular biomolecules in the solution by various methods
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1P62	Chemistry practical VIII	CO2	To learn about the basic experiments in biochemistry
B.Sc (Biotechnology / Chemistry/ Microbiology)	SC1P62	Chemistry practical VIII	CO3	Colourimetric estimation of biomolecules

	Microbiology)				
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT601	Immunology &Medical Microbiology	CO1	Learn the classification and characteristics of Isolation and identification of microorganisms from Ear, nose, throat and sputum.	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT601	Immunology &Medical Microbiology	CO2	Write down in details with examples Isolation and identification of microorganisms from clinical samples -urine	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT601	Immunology &Medical Microbiology	CO3	Understand in depth Chemical analysis of urine -crystal identification, Determination of sugar and protein in urine samples	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT601	Immunology &Medical Microbiology	CO4	Learn the details of Blood grouping	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT601	Immunology &Medical Microbiology	CO5	Understand the details of Differential count of WBC. 1 unit	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT601	Immunology &Medical Microbiology	CO6	Write down in details with application, if applicable, Coagulase test	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT601	Immunology &Medical Microbiology	CO7	Understand the classification and characteristics of WIDAL test	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT601	Immunology &Medical Microbiology	CO8	Deliberate in details with examples VDRL test	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT601	Immunology &Medical Microbiology	CO9	Specify in details with examples Spot ELISA.	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT601	Immunology &Medical Microbiology	CO10	Deliberate the details of ODD -Ouchterlony Double Diffusion	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT601	Immunology &Medical Microbiology	CO11	Understand in details with application, if applicable, RID -RadialImmuno Diffusion	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT601	Immunology &Medical Microbiology	CO12	Write down the classification and characteristics of Study of AFB –slide	
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT601	Immunology &Medical Microbiology	CO13	Identify in details with application, if applicable, Study of pathogenic microorganisms –Shigella spp, Clostridium spp, Staphylococcus spp; Streptococcus spp, Entamoeba spp; Plasmodium spp, and	



					Candida spp ( Slides)
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT602	Industrial Microbiology &Microbial Technology	CO1		history of industrial microbiology- detail history of industrial microbiology with examples, its scope and development.
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT602	Industrial Microbiology &Microbial Technology	CO4		Fermentative production of economically important compounds, biofuels, vaccines, hormones and other commercially important products
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT602	Industrial Microbiology &Microbial Technology	CO2		Fermenter- Basic structure and its operation, downstream processing, fermentation process parameters and their regulation and important components involved
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBT602	Industrial Microbiology &Microbial Technology	CO3		Microbial Technology- industrial application of enzymes and cells
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBP603	Immunology &Medical Microbiology	CO8		Deliberate in depth Tuberculosis
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBP603	Immunology &Medical Microbiology	CO9		Understand in details with examples Viral Diseases a. Rabies
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBP603	Immunology &Medical Microbiology	CO10		Identify the details of b. Hepatitis A,B
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBP603	Immunology &Medical Microbiology	CO11		Understand the details of c. HIV
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBP603	Immunology &Medical Microbiology	CO4		Understand in details with examples Important groups of pathogenic microorganisms
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBP603	Immunology &Medical Microbiology	CO5		Learn in details with examples Bacterial Diseases a. Syphilis
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBP603	Immunology &Medical Microbiology	CO6		Deliberate in depth Diphtheria
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBP603	Immunology &Medical Microbiology	CO7		Identify in details with application, if applicable, Cholera
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBP603	Immunology &Medical Microbiology	CO12		Understand the details of Protozoan Diseases a. Amoebiasis

B.Sc (Biotechnology / Chemistry/ Microbiology)	MBP603	Immunology &Medical Microbiology	CO13	Deliberate the characteristics of b. Malaria
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBP603	Immunology &Medical Microbiology	CO14	Learn the classification and characteristics of b. Cutaneous mycoses
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBP603	Immunology &Medical Microbiology	CO1	Specify in details with application, if applicable, Major developments in medical microbiology
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBP603	Immunology &Medical Microbiology	CO2	Learn in depth Factors responsible for microbial pathogenicity
B.Sc (Biotechnology / Chemistry/ Microbiology)	MBP603	Immunology &Medical Microbiology	CO3	Deliberate in details with examples Microbial flora of the human body

5266	BA (Psychology/ Journalism/ Optional English)	B0291	British Literature - Romantic Age and Facets of Languag e	CO5	Specify in details with examples victorian age
5266	BA (Psychology/ Journalism/ Optional English)	B0361	Basic Psychologic al Processes II	CO1	Deliberate in details with theories and measuring personality
5266	BA (Psychology/ Journalism/ Optional English)	B0361	Basic Psychologic al Processes II	CO2	Specify in details with thinking. types of thinking reasoning, problem solving, decision making
5266	BA (Psychology/ Journalism/ Optional English)	B0361	Basic Psychologic al Processes II	CO3	neurons, central nervous system, endocrine system
5266	BA (Psychology/ Journalism/ Optional English)	B0361	Basic Psychologic al Processes II	CO4	theories and elements of emotions
5266	BA (Psychology/ Journalism/ Optional English)	B0361	Basic Psychologic al Processes II	CO5	Learn the classification and characteristics of sensation and perception, threshold, constancy
5266	BA (Psychology/ Journalism/ Optional English)	AP4C3 S	Child Developme nt -I	CO1	Write down in details with application, if applicable, careers of child psychology
5266	BA (Psychology/ Journalism/ Optional English)	AP4C3 S	Child Developme nt -I	CO2	Specify the details of genetic foundation, abnormalities, cell division
5266	BA (Psychology/ Journalism/ Optional English)	AP4C3 S	Child Developme nt -I	CO3	Deliberate the details of stages, factors influencing, assessment , birth process prenatal development
5266	BA (Psychology/ Journalism/ Optional English)	AP4C3 S	Child Developme nt -I	CO4	Specify the details of emotional development
5266	BA (Psychology/ Journalism/ Optional English)	AP4C3 S	Child Developme nt -I	CO5	Deliberate in details with social development
5266	BA (Psychology/ Journalism/ Optional English)	AP4C3 S	Child Developme nt -I	CO6	Identify the classification and characteristics of motor development

5266	BA (Psychology/ Journalism/ Optional English)	ENGC3 S	Gener al English	EN G CO 2	Encourage the use of strategies, such as contextualization of new vocabulary, use of previewing, skimming and scanning techniques, and knowledge of text organisation and discourse markers, to aid the comprehension of written and spoken language.E
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5266	BA (Psychology/ Journalism/ Optional English)	ENGC3 S	Gener al English	EN G CO 3	Demonstrate an awareness of the significance of literature and of literary forms by being conversant about the functions of texts and their relations with historical, social, and political contexts.
5266	BA (Psychology/ Journalism/ Optional English)	ENGC3 S	Gener al English	EN G CO 4	Create awareness about the new learning styles to comprehend the theme and genre and the relevance of it in a better and deeper way and also to increase the competence in the use of ICT so that learners may more effectively achieve academic goals.
5266	BA (Psychology/ Journalism/ Optional English)	ENGC3 S	Gener al English	EN G CO 5	Learn and practice academic paragraph and essay elements including a central idea supported by relevant details and transition, with unity and organisation
5266	BA (Psychology/ Journalism/ Optional English)	ENGC3 S	Gener al English	EN G CO 1	Develop English language skills in listening, speaking, reading and writing by having learners engage in a range of communicative tasks and activities suiting Indian context
5266	BA (Psychology/ Journalism/ Optional English)	AP4C4 S	Child Developme nt -II	CO1	Deliberate in details with theories of moral development
5266	BA (Psychology/ Journalism/ Optional English)	AP4C4 S	Child Developme nt -II	CO2	Specify in details with identity, self concept and self development
5266	BA (Psychology/ Journalism/ Optional English)	AP4C4 S	Child Developme nt -II	CO3	Learn the characteristics of peer and schooling
5266	BA (Psychology/ Journalism/ Optional English)	AP4C4 S	Child Developme nt -II	CO4	Identify the details of childhood disorders like ADHD, conduct D/o, Anxiety D/o, depression, Symptoms, causes, treatments and outcomes
5266	BA (Psychology/ Journalism/ Optional English)	AP4C4 S	Child Developme nt -II	CO5	childhood disorders like Pervasive developmental D/o, Learning D/o, symptom D/o, therapies treatments and outcomes.
5266	BA (Psychology/ Journalism/ Optional English)	AP4C5 1	Abnormal psychology -I	CO1	statistical, social, mal adaptive, personal discomfort, classifications, myths
5266	BA (Psychology/ Journalism/ Optional English)	AP4C5 1	Abnormal psychology -I	CO2	Identify in depth theories of abnormality
5266	BA (Psychology/ Journalism/ Optional English)	AP4C5 1	Abnormal psychology -I	CO3	Deliberate in details with causes types and treatments of stress

5266	BA (Psychology/ Journalism/ Optional English)	AP4C5 1	Abnormal psychology -I	CO4	symptoms, causes, treatments of anxiety disorder
5266	BA (Psychology/ Journalism/ Optional English)	AP4C5 1	Abnormal psychology -I	CO5	Symptoms, causes treatments and outcomes of dissociative disorder

5266	BA (Psychology/ Journalism/ Optional English)	AP4C5 1	Abnormal psychology -I	CO6	Specify in depth somatoform disorders
5266	BA (Psychology/ Journalism/ Optional English)	AP4C5 2	Industrial Psychology - I	CO1	Specify the characteristics of introduction to Industrial psychology
5266	BA (Psychology/ Journalism/ Optional English)	AP4C5 2	Industrial Psychology - I	CO2	Write down the characteristics of job analysis and selection
5266	BA (Psychology/ Journalism/ Optional English)	AP4C5 2	Industrial Psychology - I	CO3	Learn the characteristics of employee attitude
5266	BA (Psychology/ Journalism/ Optional English)	AP4C5 2	Industrial Psychology - I	CO4	Write down the characteristics of motivation and reward systems
5266	BA (Psychology/ Journalism/ Optional English)	AP4C5 2	Industrial Psychology - I	CO5	Specify the details of consumer psychology
5266	BA (Psychology/ Journalism/ Optional English)	AP4C6 1	Abnormal psychology - II	CO1	clusters of personality disorders, symptoms and treatments
5266	BA (Psychology/ Journalism/ Optional English)	AP4C6 1	Abnormal psychology - II	CO2	Understand the classifications, Symptoms , causes, treatments and outcomes of schizophrenia
5266	BA (Psychology/ Journalism/ Optional English)	AP4C6 1	Abnormal psychology - II	CO3	Learn the classification Symptoms , causes, treatments and outcomes of mood disorders
5266	BA (Psychology/ Journalism/ Optional English)	AP4C6 1	Abnormal psychology - II	CO4	Deliberate the characteristics, Symptoms , causes, treatments and outcomes of mental retardation
5266	BA (Psychology/ Journalism/ Optional English)	AP4C6 1	Abnormal psychology - II	CO5	cognitive impairments Symptoms , causes, treatments and outcomes brain disorders
5266	BA (Psychology/ Journalism/ Optional English)	AP4C6 2	Industrial Psychology - II	CO1	Specify in details with examples performance appraisal
5266	BA (Psychology/ Journalism/ Optional English)	AP4C6 2	Industrial Psychology - II	CO2	Write down the details of training and development
5266	BA (Psychology/ Journalism/ Optional English)	AP4C6 2	Industrial Psychology - II	CO3	Write down the details of managing communications

5266	BA (Psychology/ Journalism/ Optional English)	AP4C6 2	Industrial Psychology - II	CO4	Write down in details with examples leadership, team work
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5266	BA (Psychology/ Journalism/ Optional English)	AP4C6 2	Industrial Psychology - II	CO5	Specify the details of stress and counselling
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