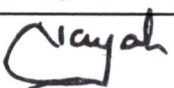
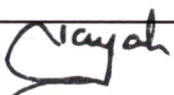


Rayat Shikshan Sanstha's
Karmaveer Bhaurao Patil College Vashi, Navi Mumbai (Autonomous)
Name of the Faculty: Science and Technology
Name of the Program: Bachelor of Science
Program Outcomes (POs)

PO 1	Disciplinary Knowledge: Understand the basic concepts, fundamental principles, theoretical formulations and experimental findings and the scientific theories related to Physics, Chemistry, Mathematics, Microbiology, Computer Science, Biotechnology, Information Technology and its other fields related to the program.
PO 2	Communication Skills: Develop various communication skills such as reading, listening and speaking skills to express ideas and views clearly and effectively.
PO 3	Critical Thinking: Propose novel ideas in explaining the scientific data, facts and figures related to science and technology.
PO 4	Analytical Reasoning and Problem Solving: Hypothesize, analyze, formulate and interpret the data systematically and solve theoretical and numerical problems in the diverse areas of science and technology.
PO 5	Sense of Inquiry: Curiously ask relevant questions for better understanding of fundamental concepts and principles, scientific theories and applications related to the study.
PO 6	Use of Modern Tools: Operate modern tools, equipments, instruments and laboratory techniques to perform the experiments and write the programs in different languages (software).
PO 7	Research Skills: Understand to design, collect, analyze, interpret and evaluate information/data that is relevant to science and technology.
PO 8	Application of Knowledge: Develop scientific outlook and apply the knowledge with respect to subject.
PO 9	Ethical Awareness: Imbibe ethical, moral and social values and exercise it in day to day life.
PO 10	Teamwork: Work collectively and participate to take initiative for various field-based situations related to science, technology and society at large.
PO 11	Environment and Sustainability: Create social awareness about environment and develop sustainability for betterment of future.
PO 12	Lifelong Learning: Ability of self-driven to explore, learn and gain knowledge and new skills to improve the quality of life and sense of self-worth by paying attention to the ideas and goals throughout the life.


Program coordinator.


BOS Chairman.


Principal



I/C PRINCIPAL
KARMAVEER BHAURAO PATIL COLLEGE
VASHI, NAVI MUMBAI 400 703.

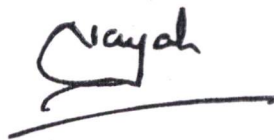
Name of the Faculty: Science and Technology
Name of the Specific Program: BSc. Biotechnology
Program Specific Outcomes (PSO)

At the end of the three-year program, the student will understand and be able to-

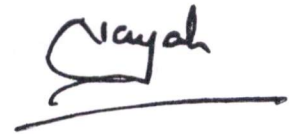
PSO-1	Identify, understand and analyze problems and propose valid solutions related to field of Biotechnology.
PSO-2	Critically evaluate biotechnological solutions on environment and societies keeping in mind the need for sustainable solutions.
PSO-3	Develop a research based ideology and technical skills to build career in Biotechnology



Program coordinator.



BOS Chairman.



Principal



I/C PRINCIPAL
KARMAVEER BHAURAO PATIL COLLEGE
VASHI, NAVI MUMBAI 400 703.

Title of Specific Program: BSc. Biotechnology		
Course code	Title of Course	Course Outcomes
		After successful completion of each course learner's will be able to;
Semester-1		
UGBTC 101	Basic Concepts of Biology	CO-1 Identify different plants & animals on the basis of their classification (4*) CO-2 Recognize basic common structures of plants & animals (4*) CO-3 Compare between vertebrates and invertebrates and classify vertebrates into various groups (3*) CO-4 Describe common groups of bacteria and archaea in different ecosystems, and their role (2*) CO-5 Explain the ultrastructure of prokaryotic and eukaryotic cells and know the function of various cell organelles present (2*)
UGBTC 102	Basics of Microbiology	CO-1 Understand scientific vocabulary relevant to microbiology (2*) CO-2 Enlist the major discoveries that gave rise to the field of microbiology and Biotechnology (1*) CO-3 Explain the importance of sterilization, disinfection and biosafety (2*) CO-4 Evaluate and assess the different types of bacteria on the basis of staining and microscopy techniques (5*) CO-5 Employ cultivation techniques to grow and enumerate microorganisms (3*)
UGBTAEC1 01	Environmental Sciences-I	CO-1 understands the importance of environmental studies. (2*) CO-2 distinguish different types of Natural Resources and its importance (3*) CO-3 analyzes different types of ecosystem on the basis of its structure and characteristics . (4*) CO-4 categorize Biogeographical classification of India and the Value of biodiversity (4*) CO-5 enlist different types of pollution, causes behind it and its impact on environment (1*)
Audit Credit Course-1	Self Development Program	CO-1 imbibes ethical, moral and social values and exercises it in day to day life. (2*) CO-2 connects to their inner self and understand their



		<p>core values.(3*)</p> <p>CO-3 Feedback Make appropriate choices on the basis of the particular situation.(3*)</p> <p>CO-4 Lead balanced life with proper time and stress management.(3*)</p> <p>CO-5 Understand others with empathy. (2*)</p>
UGBTGE10 1	Fundamentals of Chemistry	<p>CO-1 To understand the basic concepts of chemistry like nomenclature and classification of compounds,(2*)</p> <p>CO-2 To understand chemical bonds and examples of various types of bonds present in biological components(2*)</p> <p>CO3 To impart hands-on skills in preparation of Buffers and Solutions (2*)</p> <p>CO-4 To acquaint with types of Isomerism, conformation and configuration (2*)</p>
UGBTGE10 2	Biostatistics	<p>CO-1 To develop numerical ability to solve mathematical problems (2*)</p> <p>CO-2 Understand the central concepts of statistical theory and their probabilistic foundation and demonstrate statistical reasoning skills correctly (2*)</p> <p>CO-3 Apply basic statistical concepts commonly used in Health and Medical Sciences (3*)</p> <p>CO-4 Understand the differences between standard deviation and standard error (2*)</p> <p>CO-5 Acquire knowledge based on correlation analysis(2*)</p>
Semester-2		
UGBTC201	Fundamentals of Biotechnology	<p>CO-1 fundamental vocabulary and Concepts of Biotechnology (1*)</p> <p>CO-2 Differentiate between Traditional Biotechnology and Modern Biotechnology (2*)</p> <p>CO-3 State various branches and applications of Biotechnology (*1)</p> <p>CO-4 Gain knowledge on Food Biotechnology (1*)</p> <p>CO-5 Understand the concept of enzyme Biotechnology, Enzyme Immobilization and various applications (2*)</p>
UGBTC202	Biochemistry-I	<p>CO-1 Differentiate different Biomolecules and compare their importance (3*)</p> <p>CO-2 Discriminate structural and functional characteristics of various Biomolecules (3*)</p> <p>CO-3 Illustrate the structure and Characterization of Biomolecules (3*)</p> <p>CO-4 Classify enzymes on the basis of enzyme</p>

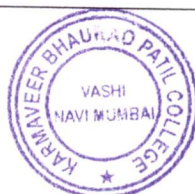


		kinetics and its mechanism of action (3*) CO-5 Contrast enzymes on the basis of their inhibition (4*)
UGBTAEC2 01	Environmental Sciences-2	CO-1 analyze the social issues associated with environment (4*) CO-2 enlist the different programs implemented for population, education and human rights. CO-3 Restate the role of IT in health and environment studies.(1*) CO-4 explain the concepts of liberalization, privatization and globalization. (2*) CO-5 identify environmental assets and causes of its depletion along with recommendations for its protection. (1*)
Audit Credit Course -2	Self Development Program	CO-1 correct way of living (2*) CO-2 transform themselves to their better version (2*) CO-3 practice meditation and relaxation techniques to keep them calm in all situations (3*)
UGBTGE20 1	Fundamentals of Computers	CO-1 Demonstrate a basic understanding of computer hardware and software (3*) CO-2 Tackle computer-based tasks more confidently (3*) CO-3 Learn to use and configure essential office applications including word processing, spreadsheets.(2*) CO-4 Develop a basic understanding of technologies and protocols used on the Internet 1*) CO-5 Analyze big data using different applications (4*) CO-6 Identify cybercrime threats and implement the knowledge of cyber security. (3*)
UGBTGE20 2	Fundamentals of Physics	CO-1 Understand core knowledge in physics, including the major premises of atomic physics, nuclear physics, optics, radiation physics, fluid dynamics.(2*) CO-2 Describe the structure of the atom, draw Bohr structure(1*) CO-3 State the location, relative charge, and atomic mass (1*) CO-4 Distinguish between the different types of radioactive decays (3*) CO-5 Use new knowledge in recognizing risks of radiation in their living and working environment (2*) CO-6 State the Newton's law of mechanics and fluid dynamics. (1*)



Semester -III

UGBTC301	Cell Biology	CO-1 Develop an understanding of the various aspects of cell biology. (2*) CO-2 Understand the principles of cellular transport & its role in different processes in body. (2*) CO-3 Understand the structures of cell skeleton & its role. (2*)
UGBTC302	Genetics	CO-1 Understand basic concepts in Mendelian genetics (2*) CO-2 Learn various genetic changes in relation to mendelian genetics (2*) CO-3 Understand molecular events in cell cycle (2*) CO-4 Comment on various genetic abnormalities (3*) CO-5 Use mapping techniques (3*)
UGBTC303	Molecular Biology & Instrumentation	CO-1 Learn structures of nucleic acids (2*) CO-2 Find out difference between prokaryotic & eukaryotic DNA replication (3*) CO-3 Understand central dogma of life (2*) CO-4 Learn concept of genetic code (2*) CO-5 Describe translation & post translation events in organism (2*)
UGBTSEC301	Food Science and Nutrition	CO-1 Learn basic concepts of food (2*) CO-2 Physicochemical properties of food (2*) CO-3 Identify daily nutrient requirement of human body (3*) CO-4 Classify food as per role and functions (3*) CO-5 develop food regime for different age group people (3*) CO-6 learn various food laws (2*)
UGBTSEC302	Food Adulteration & Safety	CO-1 Learn basic concepts of food (2*) CO-2 Physicochemical properties of food (2*) CO-3 Identify daily nutrient requirement of human body & deficiency related disorders (3*) CO-4 Learn various aspects of food safety (2*)
UGBTGE301	Research Methodology	CO-1 Understand the principles of research methodology and its significance (2*) CO-2 Understand the methods of data collection, interpretation and report writing (2*) CO-3 Understand the importance of communication and its role in science (2*)
UGBTGE302	Entrepreneurship Development	CO-1 Develop an understanding of the systematic process (2*) CO-2 Identify the business idea (3*) CO-3 Design strategies for successful implementation of Ideas (4*)

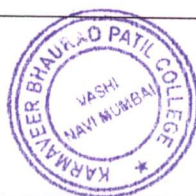


Semester -IV

UGBTC401	Immunology	CO-1 Describe the interaction between antigens and antibodies (1*) CO-2 Understand significances of various methods of antigen/antibody detection and quantification(2*) CO-3 Understand the receptors involved in signal transduction to elicit an immune response (2*) CO-3 Understand the negative effects of overexpression of immune respons(2*)
UGBTC402	Genetic Engineering	CO-1 Learn enzymes used in genetic engineering (2*) CO-2 Understand properties of vector (2*) CO-3 Learn various concepts of recombinant DNA technology(2*) CO-4 Describe techniques in transgenic animal and plants (3*)
UGBTC403	Medical Microbiology	CO-1 Learn various concepts in medical microbiology (2*) CO-2 List the factors playing a role in causing a disease. (3*) CO-3 Discuss the various aspects of systemic infections including causative agents, symptoms and prophylaxis (4*) CO-4 Gain the technical capability of handling, isolating and identifying various bacteria (2*)
UGBTSEC401	Biofertilizer Production	CO-1 Learn importance of biofertilizer (2*) CO-2 Understand classification of biofertilizer (2*) CO-3 Properties of biofertilizers (2*) CO-4 Discuss applications of biofertilizers (4*)
UGBTSEC402	Mushroom Cultivation	CO-1 Learn aspects in mushroom cultivation (2*) CO-2 Understand classification of mushroom (2*) CO-3 Learn properties of various mushroom (2*) CO-4 Design model strategy for mushroom cultivation (4*)
UGBTGE401	Evolution and Ecology	CO-1 Learn aspects various aspects in Evolution and related theories (2*) CO-2 Understand concepts of speciation (2*) CO-3 Learn properties of Ecosystem (2*) CO-4 Design model for varied interactions (4*) CO-5 Understand the concept of nutrient recycling (2*)
UGBTGE402	Bioethics and Biosafety	CO-1 Learn the concept of Biosafety cabinet (2*) CO-2 Understand the concept of bioethics (2*) CO-3 Design work practices in biosafety cabinet (4*) CO-4 Learn ethical issues in rDNA technology (2*) CO-5 Learn risk assessment and management aspects in bioethics(2*)



UGBTAC505	Applied Component- Biosafety and Intellectual Property Rights	CO- 1. Risk associated with various lab procedures, protocols, apparatus etc. (2*) CO- 2. Biosafety issues in context with Biotechnology. (4*) CO- 3. Types of pharma products (2*) CO- 4. Regulatory procedures associated with testing of contaminants in food and pharma products. (4*) CO- 5. Different types of intellectual property rights and when to exercise them. (4*) CO- 6. Basics of patent drafting procedure and parts of patent application. (5*)
Semester -VI		
UGBT601	Biochemistry	CO-1. Concept of protein denaturation and protein folding. (2*) CO-2. Complementary interactions between proteins and legends (3*) CO-3. Biosynthesis pathways of carbohydrates and lipids and its importance (2*) CO-4. Role of different hormones in body and their mechanism of action. (2*) CO-5. Functions and disorders associated with different vitamins and minerals (2*)
UGBT602	Industrial Microbiology	CO-1. Normal flora of milk and factors affecting quality of milk, milk products (2*) CO-2. The concept of milk preservation through pasteurization (2*) CO-3. The concept and methods under downstream processing and its implications (2*) CO-4. Fermentation processes using scale up and scale down approaches (3*) CO-5. Industrial production of commercially important products (3*) CO-6. The concepts of GMP, GLP, QA and QC and its significance (2*)
UGBT603	Basic Pharmacology and Toxicology	CO-1. Mechanism of drug action, drug receptors and biological responses. (2*) CO-2. Concept of drug antagonism, potency and intrinsic activity. (2*) CO-3. Various factors affecting the rate of drug absorption. (4*) CO-4. Influence of various factors during drug distribution. (2*) CO-5. Concept of drug metabolism and excretion. (2*) CO-6. The concepts of basic and regulatory toxicology. (2*)
UGBT604	Environmental Biotechnology	CO-1. Different sources of pollution and its environmental effects. (2*) CO-2. Difference between conventional and alternative



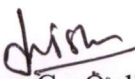
Semester -V

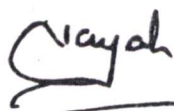
UGBT501	Cell Biology & Chemotherapeutic Agents	<p>CO-1. Differentiation between cell cycle in prokaryotes and eukaryotes. (3*)</p> <p>CO-2. Mechanism which controls cell division (2*)</p> <p>CO-3. Mechanism of differentiation of cells (2*)</p> <p>CO-4. Molecular genetics of cancer and its control (2*)</p> <p>CO-5. Mode of action of different chemotherapeutic agents. (2*)</p> <p>CO-6. The concept of drug resistance and measures to prevent it. (2*)</p>
UGBT502	Bio-analytical Techniques	<p>CO-1. Principle and applications of different types of electrophoresis techniques. (3*)</p> <p>CO-2. Principle and applications of different types of centrifugation techniques. (3*)</p> <p>CO-3. Principle and applications of different types of spectrophotometric electrophoresis techniques. (3*)</p> <p>CO-4. Principle and applications of different types of chromatographic techniques. (3*)</p> <p>CO-5. Role of radioisotopes in different tracer techniques and its applications. (3*)</p>
UGBT503	Regulation, Genomes and Omics	<p>CO- 1. Regulation of gene expression at DNA and RNA level. (4*)</p> <p>CO- 2. Concept of epigenetic control in gene expression and its effect. (4*)</p> <p>CO- 3. The concept of physical and chemical methods of transferring genes in to plants and animals. (2*)</p> <p>CO- 4. Human genome mapping and its implications. (3*)</p> <p>CO- 5. The importance of CRISPER/CAS system and Gene therapy. (3*)</p> <p>CO- 6. History and Components of 'Omics'. (2*)</p> <p>CO- 7. The analysis of Genomics, Epigenomics, Transcriptomics, Proteomics and Metabolomics. (4*)</p>
UGBT504	Marine Biotechnology	<p>CO- 1. The concepts related to marine biotechnology and its applications. (2*)</p> <p>CO- 2. The microbes in marine aquatic environment, their role and its interaction with ecosystem. (2*)</p> <p>CO- 3. Pharmaceutical compounds from marine ecosystem and its potential applications. (3*)</p> <p>CO- 4. Marine microbial enzymes and its applications. (3*)</p> <p>CO- 5. Clinical trial and challenges associated with marine products. (5*)</p> <p>CO- 6. Emphasize on marine functional foods and nutraceuticals. (4*)</p> <p>CO- 7. Different types of marine bioresources. (3*)</p> <p>CO- 8. The concept of cosmeceuticals and its applications (2*)</p>

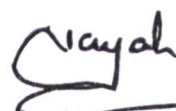


		<p>energy resources and their sources. (4*)</p> <p>CO-3. Technologies and procedures used to harness energy from various non- conventional energy resources. (3*)</p> <p>CO-4. Biological (aerobic and anaerobic) methods to treat effluent and wastewater. (2*)</p> <p>CO-5. Biological agents and sensors used to detect pollutants in environment. (3*)</p> <p>CO-6. Concept of bioremediation (2*)</p>
UGBTAC605	Agri-Biotechnology	<p>CO-1. The concept of precision agriculture and agriculture systems (2*)</p> <p>CO-2. The concept of greenhouse technology and its function (2*)</p> <p>CO-3. Plant stress biology in relation to biotic and abiotic factors (3*)</p> <p>CO-4. Concept of genetic markers in plant breeding. (4*)</p> <p>CO- 5. Plant DNA barcoding and recent advances. (4*)</p> <p>CO-6. Monoculture, Co culture inoculant and Polymicrobial inoculant formulations (3*)</p>

Numbers in bracket () indicate cognitive levels of revised Blooms Taxonomy as follows:
(1): Remembering , (2): Understanding , (3): Applying , (4): Analysing, (5): Evaluating,
(6): Creating


Program Co-Ordinator


BOS Chairman


Principal

