

Chaitanya Bharathi Institute of Technology (Autonomous)

Department of Biotechnology

B. Tech Biotechnology Program Outcomes (POs)

1. **Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization for the solution of complex engineering problems
2. **Problem analysis:** Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety, and cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling to complex engineering activities, with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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R 22 Regulation

DEPARTMENT VISION AND MISSION

VISION

To excel in education, research and entrepreneurship in various fields of Biotechnology for contribution to the evolving needs of the society

MISSION

1. To provide an excellent educational experience to the undergraduate students of Biotechnology through quality teaching and advanced curriculum with roots into the fundamentals, that enables students to become leaders in their chosen field of Biotechnology
2. To provide vibrant learning and research environment that enables students to focus on lifelong learning to transform into entrepreneurs, and renowned researchers
3. To instil the spirit of innovation and creativity in young minds through participation in International and National level conferences/hackathons combined with a deep awareness of ethical responsibilities to profession and society

PROGRAM EDUCATIONAL OBJECTIVES (PEOS):

The Biotechnology department is dedicated to graduating engineers who,

1. Will demonstrate successful careers in industry through scientific thinking, interpreting, analysing experimental results and pursue higher education and research in reputed national and international institutes.
2. Will demonstrate leadership and initiative to advance professional and organizational goals with a commitment to ethical standards of profession, teamwork, and respect for diverse cultural background
3. Will be involved in lifelong /self-learning to keep abreast with the constantly evolving technologies for establishing start-ups and becoming successful entrepreneurs.
4. Will be committed to creative practice of engineering and other professions in a responsible manner contributing to the socio-economic development of the society.

B. Tech (Biotechnology) Program Specific Outcomes (PSOs)

[In addition to POs]

The student should be able to

1. Apply the concepts of Biotechnology in the fields of health care, agriculture, biofuels, food industry, and other relevant areas
2. Demonstrate adequate proficiency in good lab practices by adopting standard operating protocols and illustrate independent, safe and accurate handling of the biotechnology lab equipment

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DEPARTMENT VISION AND MISSION

VISION

Imparting quality education to produce graduates as competent researchers, technologist and entrepreneurs in the field of Biotechnology.

MISSION

1. Imbibing adequate knowledge in principles of mathematics, physics, chemistry, biological sciences and process controls,
2. Molding the graduates effectively to serve mankind with professional competency and socioethical values.
3. Motivating graduates towards academic excellence, entrepreneurial avenues and identifying challenging areas where Biotechnology can cater to the solution.

PROGRAM EDUCATIONAL OBJECTIVES (PEOS):

1. Graduates will be trained to co integrate life sciences and engineering to broaden the avenues of Biotechnology applications.
2. Graduates are provided with apt academic environment for successful careers in industry, pursue higher education and research in reputed national and international institutes.
3. Inculcating scientific thinking in to graduates, making them capable of conducting experiments, interpreting, analyzing results and documenting well written technical reports.
4. Graduates are trained for effective oral and written communication skills, teamwork and professional ethics.
5. Graduates are made to realize the importance of lifelong self-learning to be abreast with the constantly evolving field of biotechnology

B. Tech (Biotechnology) Program Specific Outcomes (PSOs)

PSO1: Graduates are able to cater the needs of biotechnology industries, academic and research Institutions.

PSO2: Graduates are able to identify needs and problems of the society and design biotechnology driven solutions.

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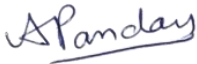
Chaitanya Bharathi Institute of Technology (A)

Department of Biotechnology

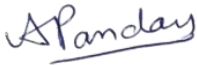
Course Outcomes Statements for AY 2022-23

I Semester

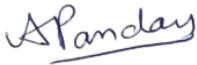
S.no.	Subject Name	Subject Code	Course Outcomes
1	Mathematics-I	22MTC03	1. Calculate the elementary transformations of trigonometric functions.
		22MTC03	2. Evaluate the limit and Continuity of the functions
		22MTC03	3. Calculate the differentiation of functions
		22MTC03	4. Apply the matrix methods to solve the system of linear equations.
		22MTC03	5. Solve the Cubic and Bi-quadratic equations.
2	Basics of Biology-I	22BTC01	1. Outline the theories behind the origin of life and evolution studies.
		22BTC01	2. Describe the structure and functions of plant cell and its organelles.
		22BTC01	3. Relate the plants based on the habit and habitat and mechanism of seed development in plants.
		22BTC01	4. Infer the basic physiological processes in plants and various methods of crop improvement.
		22BTC01	5. Demonstrates characteristics of bacteria, fungi, virus and explains virus related diseases and economic importance of microbes.
3	Chemistry	22CYC01	1. Identify the microscopic chemistry in terms of molecular orbitals, intermolecular forces and rate of chemical reactions.
		22CYC01	2. Discuss the properties and processes using thermodynamic functions, electrochemical cells and their role in batteries and fuel cells.
		22CYC01	3. Illustrate the major chemical reactions that are used in the synthesis of organic molecules
		22CYC01	4. Classify the various methods used in treatment of water for domestic and industrial use.
		22CYC01	5. Outline the synthesis of various Engineering materials & Drugs.


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4	Basic Electrical Engineering	22EEC01	1. Understand the concepts of Kirchoff's laws and their application various theorems to get solution of simple dc circuits.
		22EEC01	2. Predict the steady state response of RLC circuits with AC single phase/three phase supply.
		22EEC01	3. Infer the basics of single phase transformer
		22EEC01	4. Describe the construction, working principle of DC machine and 3-phase Induction motor
		22EEC01	5. Acquire the knowledge of electrical wires, cables, earthing, Electrical safety precautions to be followed in electrical installations and electric shock and its safety and energy calculations.
5	Problem Solving and Programming	22CSC01	1. Understand real world problems and develop computer solutions for those problems.
		22CSC01	2. Understand the basics of Python.
		22CSC01	3. Apply Python for solving basic programming solutions
		22CSC01	4. Create algorithms/flowcharts for solving real-time problems
		22CSC01	5. Build and manage dictionaries to manage data.
		22CSC01	6. Handle data using files.
6	Chemistry Lab	22CYC02	1. Identify the basic chemical methods to analyse the substances quantitatively & qualitatively
		22CYC02	2. Estimate the amount of chemical substances by volumetric analysis.
		22CYC02	3. Determine the rate constants of reactions from concentration of reactants/ products as a function of time.
		22CYC02	4. Calculate the concentration and amount of various substances using instrumental techniques
		22CYC02	5. Develop the basic drug molecules and polymeric compounds.
7	Community Engagement	22MBC02	1. Gain an understanding of Rural life, Culture and Social realities.
		22MBC02	2. Develop a sense of empathy and bonds of mutuality with Local Communities.
		22MBC02	3. Appreciate significant contributions of Local communities to Indian Society and Economy.

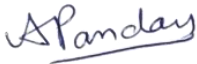

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		22MBC02	4. Exhibit the knowledge of Rural Institutions and contributing to Community's Socio-Economic improvements.
		22MBC02	5. Utilise the opportunities provided by Rural Development Programmes.
8	Problem Solving and Programming Lab	22CSC02	1. Understand various Python program development Environments.
		22CSC02	2. Demonstrate the concepts of Python.
		22CSC02	3. Implement algorithms/flowcharts using Python to solve real-world problems.
		22CSC02	4. Build and manage dictionaries to manage data.
		22CSC02	5. Write Python functions to facilitate code reuse.
		22CSC02	6. Use Python to handle files and memory.
9	Robotics & Drones Lab	22MEC37	1. Demonstrate knowledge of the relationship between mechanical structures of robotics and their operational workspace characteristics
		22MEC37	2. Understand mechanical components, motors, sensors and electronic circuits of robots and build robots.
		22MEC37	3. Demonstrate knowledge of robot controllers.
		22MEC37	4. Use Linux environment for robotic programming.
		22MEC37	5. Write Python scripts to control robots using Python and Open CV.
10	Basic Electrical Engineering Lab	22EEC02	1. Comprehend the circuit analysis techniques using various circuital laws and theorems.
		22EEC02	2. Analyse the parameters of the given coil and measurement of power and energy in AC circuits
		22EEC02	3. Determine the turns ration/performance parameters of single-phase transformer
		22EEC02	4. Infer the characteristics of DC shunt motor different tests.
		22EEC02	5. Illustrate different parts and their function of electrical components, equipment and machines.

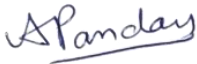

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II Semester

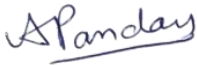
S.n o.	Subject Name	Subject Code	Course Outcomes
1	Mathematics-II/	22MTC06	1. Apply the basic operations on Scalar and Vectors.
		22MTC06	2. Apply the vector differential operators to Scalars and Vector functions.
		22MTC06	3. Solve partial fractions by various methods.
		22MTC06	4. Evaluate definite and indefinite Integral.
		22MTC06	5. Solve the first order ordinary differential equations
2	Basics of Biology-II	22BTC02	1. Identify the basic structure, function of various animal cell organelles, level of organization and types of tissues in animals.
		22BTC02	2. Explains nomenclature and the animal kingdom classification with its characteristic features.
		22BTC02	3. Explain and identify the lifecycles, diseases, treatment and preventive measures of human pathogens.
		22BTC02	4. Outline population ecology, various biotic and abiotic environmental factors of ecosystem.
		22BTC02	5. To give an insight on genes, chromosome, blood grouping system and gene expression.
3	Physics	22PYC07	1. Demonstrate the physical properties of the light.
		22PYC07	2. Find the applications of lasers and optical fibers in engineering and technology. .
		22PYC07	3. Identify different types of magnetic and dielectric materials
		22PYC07	4. Recall the fundamentals of nanomaterials.
		22PYC07	5. Apply the ideas of quantum mechanics for related problems
4	Engineering Mechanics	22CEC01	1. Calculate the components and resultant of coplanar forces system and Draw free body diagrams to analyze the forces in the given structure
		22CEC01	2. Understand the mechanism of friction and can solve friction problems
		22CEC01	3. Analyse simple trusses for forces in various members of a truss.
		22CEC01	4. Determine the centroid of plane areas, composite areas and centres of gravity of bodies.


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		22CEC01	5. Determine moments of inertia, product of inertia of plane and composite areas and mass moments of inertia of elementary bodies,
5	English	22EGC01	1. Illustrate the nature, process and types of communication and communicate effectively without barriers.
		22EGC01	2. Construct and compose coherent paragraphs, emails and adhering to appropriate mobile etiquette. grammar and appropriate vocabulary.
		22EGC01	3. Apply techniques of precision to write a précis and formal letters by using acceptable
		22EGC01	4. Distinguish formal from informal reports and demonstrate advanced writing skills by drafting formal reports.
		22EGC01	5. Critique passages by applying effective reading techniques
6	Physics Lab	22PYC10	1. Interpret the errors in the results of an experiment.
		22PYC10	2. Demonstrate the wave nature of light experimentally
		22PYC10	3. Utilize physical properties of magnetic and dielectric materials for various applications
		22PYC10	4. Make use of lasers and optical fibers for engineering applications
		22PYC10	5. Explain light induced phenomenon and motion of electrons in electric and magnetic fields
7	English lab	22EGC02	1. Define the speech sounds in English and understand the nuances of pronunciation in English.
		22EGC02	2. Apply stress correctly and speak with the proper tone, intonation and rhythm.
		22EGC02	3. Analyze listening comprehension texts to enhance their listening skills
		22EGC02	4. Determine the context and speak appropriately in various situations.
		22EGC02	5. Design and present effective posters while working in teams, and discuss and participate in Group discussions.
8	CAD and Drafting	22MEC01	1. Become conversant with appropriate use of CAD software for drafting.
		22MEC01	2. Recognize BIS, ISO Standards and conventions in Engineering Drafting.
		22MEC01	3. Construct the projections of points, lines, planes, solids


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		22MEC01	4. Analyse the internal details of solids through sectional views
		22MEC01	5. Create an isometric projections and views
9	Digital Fabrication Lab	22MEC38	1. Understand safety measures to be followed in workshop to avoid accidents.
		22MEC38	2. Identify various tools used in carpentry, house wiring and plumbing
		22MEC38	3. Make a given model by using workshop trades like carpentry, plumbing, House wiring and 3d modeling using solid works software for Additive Manufacturing
		22MEC38	4. Perform pre-processing operations on STL files for 3D printing, also understand reverse engineering process.
		22MEC38	5. Conceptualize and produce simple device/mechanism of their choice.


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