Deccan Education Society's
Fergusson College (Autonomous), Pune

Program Specific Outcomes(PSOs) and Course Outcomes (COs) 2019-20

Department of Biotechnology
Programme: M.Sc. Biotechnology

PSO No.	Program Specific Outcomes(PSOs) Upon completion of this programme the student will be able to
PSO1	**Academic competence:** (i) Gain strong foundation and knowledge in scientific fundamentals and acquire comprehensive understanding of the principles and practices of biotechnology including skill-based concepts, in an interdisciplinary course structure, provided by highly qualified and competent faculty. (ii) Acquire training in techniques/skills utilised in biotechnology and understand the scope and applications of biotechnology in well equipped and state of the art laboratories. (iii) Achieve competence for higher studies, research and be employment ready in the domain of Biotechnology and allied fields. (iv) Demonstrate qualities of responsible biotechnologists that can work within the interdisciplinary framework of biotechnology and related fields.
PSO2	**Personal and Professional Competence:** (i) Analyze and interpret data and provide solutions to basic problems relevant to biotechnology and related fields. (ii) Apply appropriate tools and techniques in biotechnology, combine experimental and computational approaches to design and perform experiments proficiently. (iii) Demonstrate and apply knowledge and skill in the design and development of solutions for relevant problems to cater to the requirements of biotechnology industries. (iv) Acquire good oral and written communication skills. (v) Experience the opportunity to curate/ manage or participate in a variety of co and extracurricular activities that will cater to the overall personality development.
PSO3	**Research Competence:** (i) Develop an interdisciplinary approach to conduct original research in various fields of Biotechnology and allied fields. (ii) Demonstrate appropriate skills in design of experiments with appropriate controls, critical thinking and result analysis. (iii) Apply statistical skills and computational tools to explore, analyse and authenticate biological data in experiments and research.
PSO4	**Entrepreneurial and Social competence:** (i) Implement skills and knowledge acquired in skill imparting and entrepreneurial courses in upcoming fields of Biotechnology. (ii) Develop a sense of social, ethical, environmental and professional responsibility. (iii) Practise professional ethics in the conduct of Science Rucha Potnis-Page1 (iv) Recognize the importance of Bioethics, IPR, entrepreneurship, Communication and management skills so to be ready to pursue future course of career.

F.Y. M.Sc. Semester I		
Title of the Course and Course Code	**Molecular Biology (BTH4101)**	**Number of Credits : 04**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
CO1	Describe the process of protein synthesis in prokaryotes, eukaryotes and how prokaryotic genomes, eukaryotic genomes are packaged, organized, remodelled for molecular processes.	1
CO2	Outline the basics of DNA damage and repair, DNA recombination, transposable DNA elements and discuss the proteins and enzymes required for the above processes.	2
CO3	Examine the process of DNA replication and its regulation by the combination of DNA polymerases and other regulatory proteins.	3
CO4	Analyze and differentiate gene expression and its regulation in the processes in prokaryotes and eukaryotes. Explain the post-transcriptional processing and transport of RNAs.	4
CO5	Evaluate the effects of changes in genetic code by interpreting the mutations.	5
CO6	Specify the need for regulation of protein synthesis and elucidate the mechanisms.	6
Title of the Course and Course Code	**Cell Biology (BTH4102)**	**Number of Credits : 04**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
CO1	Recall different types of cells. List specialized cells and describe their structure, functions.	1
CO2	Explain structure, properties of Biomembrane and discuss–structure, functions of different cell organelles.	2
CO3	Illustrate the assembly and dynamics of the cytoskeletal network of microfilaments, intermediate filaments, microtubules and interpret different types of cell communication.	3
CO4	Analyze the various cell signalling pathways, and their receptors to explain the regulation of gene expression linked to external stimuli and different mechanisms of transport of material across the membrane.	4
CO5	Evaluate, collect information and justify the structure, normal functioning, interaction, transport, trafficking, signalling and abnormal behaviour leading to cancer.	5
CO6	Compile information on cell imaging and fractionation techniques.	6

Title of the Course and Course Code	**Biological Chemistry and Bacteriology (BTH4103)**	**Number of Credits : 04**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
CO1	Describe the techniques for protein structure determination and for protein-protein interaction studies.	1
CO2	Discuss interaction of signalling, metabolic pathways and infer body's response to metabolically abnormal situations.	2
CO3	Apply the concepts of enzymology and techniques for studying activity, kinetics, regulation.	3
CO4	Categorize the Molecular techniques for characterization of bacteria. Explain Molecular basis of various events in the bacterial life cycle, bacterial pathogenesis and diagnosis, antibacterial and associated problems	4
CO5	Review metabolic diversity of bacteria ,quorum sensing phenomenon and current trends in bacteriology	5
CO6	Revise bacterial growth, kinetics and specify the molecular adaptations of extremophiles.	6
Title of the Course and Course Code	**Developmental Biology and Human Population Genetics (BTH4104)**	**Number of Credits : 04**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
CO1	Describe the processes in early development and apply the concepts in human development.	1
CO2	Discuss the different cellular organizations during development that lead to development of multicellular organisms from a zygote.	2
CO3	Illustrate different techniques and advancements to study developmental Biology and review different biomedical tests	3
CO4	Explain Mendel's laws of inheritance and understand genetic aberrations.	4
CO5	Evaluate principles of genetic linkage and chromosome mapping.	5
CO6	Prepare a report on the nature of various genetic disorders, their diagnosis and testing techniques.	6

Title of the Course and Course Code	**Biotechnology Practical-I (BTH4105)**	**Number of Credits : 04**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
	Description (Molecular Biology)	
CO1	Outline the concept and need of RNA isolation from prokaryotic and eukaryotic systems. Tell the important steps and precautions necessary for RNA isolation.	1
CO2	Explain the technique of PAGE and use it to analyse histones	2
CO3	Carry out agarose gel electrophoresis to determine mononucleosome size by isolation of nuclei and chromatin.	3
	Description (Cell Biology)	
CO4	Analyze different cell junctions by preparation of permanent slides	4
CO5	Determine the steps of isolation of mitochondria and lysosomes by sucrose density gradient centrifugation technique and test for SDH and acid phosphatase activity.	5
CO6	Specify the phenomenon of programmed cell death during limb development in chick embryo.	6

Title of the Course and Course Code	**Biotechnology Practical-II (BTH4106)**	**Number of Credits : 04**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
CO1	Describe the concept of embryonic development and its different stages in Chick and Drosophila.	1
CO2	Explain Mendel's law of inheritance, construct pedigrees and analyze the pattern of inheritance in the families. Demonstrate visualization of Barr Bodies.	2
CO3	Carry out enzyme isolation, purification and characterization. Explain how to optimize enzyme assay conditions and Determine the factors affecting enzyme activity.	3
CO4	Analyze growth rate of bacteria under varying conditions. Identify bacterial pathogens, test antibiotic sensitivity.	4
CO5	Determine different in vitro culture systems and analyze the effect of different factors on growth and development.	5
CO6	Design and perform extraction of bioactive principles from plant sources.	6

F.Y. M.Sc. Semester II		
Title of the Course and Course Code	**Genetic Engineering and Industrial Biotechnology-I (BTH4201)**	**Number of Credits : 04**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
CO1	Outline the basics of recombinant DNA technology. List various tools such as DNA modifying enzymes, vectors, host types, screening methods essential for recombinant DNA technology.	1
CO2	Explain various expression strategies and methods for producing industrially important molecules, techniques for analyzing genes and gene expression in prokaryotic and eukaryotic host systems. Outline strategies for expression of industrially important products in prokaryotic and eukaryotic host systems.	2
CO3	Illustrate the need of advanced tools and vectors in Genome re-coding, Gene editing. Classify different methods of gene sequencing and predict the need of genetic engineering and genetically modified organisms	3
CO4	Integrate fundamentals and applications of biological and engineering principles to microbial systems required in Fermentation Industry	4
CO5	Review the upstream and downstream processes for successful operation of bioprocess	5
CO6	Specify the principles of Air and medium sterilization to design Batch and Continuous Sterilization cycles.	6
Title of the Course and Course Code	**Plant Biotechnology and Animal Biotechnology (BTH4202)**	**Number of Credits : 04**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
CO1	Identify economically important Algae and Fungi. Discuss Qualitative and Quantitative improvement and Applications.	1
CO2	Explain Secondary Metabolites in plants and their biogenesis. Review their significant role in plant defense. Specify Biotechnological tools to enhance the production of secondary metabolites	4,5,6
CO3	Describe transgenic techniques used for Biotic and Abiotic stress tolerance in plants. Apply this technique to increase productivity, for quality improvement and production of antibodies in plants.	1,3
CO4	Implement principles of animal cell culture, media preparation, laboratory use.	3
CO5	Explain in vitro fertilization and embryo transfer technology. Describe the limitations and challenges facing the animal industries and disciplines	1,2
CO6	Discuss and extrapolate ethical concerns over the use of animal biotechnology	2

Title of the Course and Course Code	**Virology and Immunology (BTH4203)**	**Number of Credits : 04**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
CO1	Outline classification of viruses and compare and contrast virus replication strategies of different viruses.	1
CO2	Discuss the mode of action of antiviral drugs and various viral vaccine strategies.	2
CO3	Illustrate the immunopathogenesis of viral infections, role of oncogenic viruses and cancer immunology.	3
CO4	Explain components of immune system, types of immunity and the complement system.	4
CO5	Review the types, regulation, cellular and molecular basis of immune response and molecular immunology.	5
CO6	Write and discuss about autoimmune diseases, transplant immunology and animal models in immunology.	6
Title of the Course and Course Code	**Biotechnology Practical–III (BTH4204)**	**Number of Credits : 04**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
	Description (Genetic Engineering)	
CO1	Describe the concept and need of competent cells for genetic engineering. Outline the reagents and essential steps for bacterial transformation. Outline various methods for analysis and selection of transformants.	1
CO2	Discuss the important steps and precautions necessary for Isolation of the plasmid DNA and its quantification. Outline primer designing process using online tools and PCR process. Summarize the strategy for cloning and expression of recombinant products.	2
	Description (Animal Biotechnology)	
CO3	Design the laboratory plan and describe the concept.	6
CO4	Illustrate the rationale behind different media compositions and reconstitute the media. Demonstrate in vitro cell culture and analyze the different growth properties like cell number, viability and morphology.	2,3,4
	Description (Plant Biotechnology)	
CO5	Identify suitable medium and maintain culture of Spirulina or Demonstrate mushroom cultivation and Analyze biochemically.	1,3,4
CO6	Demonstrate how to isolate plant cell protoplast by enzymatic technique. Describe in vitro production of secondary metabolites by using suitable technique.Recommend Anther culture technique to raise haploid plants.	1,3,5

Title of the Course and Course Code	**Biotechnology Practical-III (BTH4205)**	**Number of Credits : 04**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
CO1	Perform primary screening and identify a potential production strain	4,6
CO2	Design optimization of parameters and formulation of fermentation media	6
CO3	Assemble and operate Lab bench fermenter for production of a product and estimate the product yield obtained	2,6
CO4	Identify, operate and analyse antigen antibody interactions with immunological techniques	1,3,5
CO5	Standardize and implement methods used for laboratory diagnosis of viral infections	3,5
CO6	Organize a visit to a Virology facility and prepare a report.	6
Title of the Course and Course Code	**Critical Reading of Primary Scientific Literature (Elective) (BTH4206)**	**Number of Credits : 02**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
CO1	Describe classical and recent research publications from various relevant subjects such as genetics, animal and plant biotechnology, microbiology, biophysics. List the materials and methods used in the research article	1
CO2	Infer strengths and weaknesses of each experiment from the selected papers.	2
CO3	Interpret and describe the data represented in the selected research paper.	3
CO4	Analyze how the authors interpreted the data and appraise the discussion presented.	4
CO5	Review the classical and recent research publications from various relevant subjects, new techniques and their applications	5
CO6	Devise how to present data through a seminar, write scientific text and communicate research clearly	6

Title of the Course and Course Code	**Agricultural Biotechnology (Elective) (BTH4207)**	**Number of Credits : 02**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
CO1	Describe the concept of agriculture biotechnology as a science.	1
CO2	Explain the different types of molecular markers used in agriculture biotechnology and discuss their applications in improvement of crop traits. Discuss DNA barcoding and clonal fidelity for selection of elite traits in crops.	2
CO3	Apply the concept of RNAi and mutagenesis in crop biotechnology. Illustrate different methods for gene expression and profiling used to select for the elite crop varieties.	3
CO4	Analyze and explain the importance of Eco-TILLING, and high-throughput genotyping techniques	4
CO5	Evaluate the genetics of resistance, 'R' genes and the use of genetic engineering techniques for developing disease resistance varieties.	5
CO6	Devise new strategies to prevent spread of disease, to protect, improve and conserve the economically important agricultural plants. Develop and design new strategies for crop transgenics.	6
Title of the Course and Course Code	**Environmental Biotechnology (Elective) (BTH4208)**	**Number of Credits : 04**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
CO1	Specify the Global and regional threats to the environment.	6
CO2	Illustrate the role of biotechnology in controlling pollutants of the environment.	2,3
CO3	Analyze the methods of environmental monitoring and sample analysis.	4
CO4	Describe the role of remote sensing in environmental monitoring	1
CO5	Outline the concept of GIS and explain its application in environmental studies.	3,4
CO6	Determine the significance of EIA and EQAM. Articulate environmental laws, policies, audits and ethics	2,5

Title of the Course and Course Code	**Microbial Genetics (Elective) (BTH4209)**	**Number of Credits : 04**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
CO1	Summarize the fundamentals of genetics.	2
CO2	Explain natural gene transfer mechanisms in bacteria.	4
CO3	Illustrate gene mapping techniques.	3
CO4	Describe molecular basis of phage life cycles and significance.	1
CO5	Explain and justify yeast genetics as a eukaryotic model system.	4,5
CO6	Specify the fungal model systems for genetic studies.	6
Title of the Course and Course Code	**Clinical Research (Elective) (BTH4211)**	**Number of Credits : 04**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
CO1	Discuss and analyse the new drug development process and discuss regulatory and ethical requirements.	2,4
CO2	Design a basic protocol for the conduct of scientific enquiry and the interpretation of the data obtained.	6
CO3	Demonstrate competency in clinical methods, including accurately reporting observations, analysis and understand clinical management practice.	2,3
CO4	Specify the principles of Pharmacovigilance.	5
CO5	Describe and employ the drug regulatory affairs and ethical requirements.	1,3
CO6	Demonstrate critical thinking skills to improve employment opportunities.	3
Title of the Course and Course Code	**Bioethics and Biosafety (Elective) (BTH4212)**	**Number of Credits : 04**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
CO1	Discuss the animal rights/welfare, importance of Animal and Human ethical committees and their working. Explain the importance of animal welfare rights	1,4
CO2	Describe the ethical aspects related to biological, biomedical, health care and biotechnology research. List the EPA act and rules, guidance documents, regulatory framework and mandates of – RCGM, GEAC, IBSC and other regulatory bodies.	1
CO3	Outline the importance of bioethics in health care patient confidentiality, informed consent, euthanasia, artificial reproductive technologies, prenatal diagnosis, genetic screening, gene therapy, transplantation. Articulate the Regulations (International /national) for	1,2

	animal and biomedical research; Human and animal experimentation	
CO4	Infer and explain the need for accreditation for healthcare purposes and elaborate on its process. Discuss the Good Lab Practices.	2,3,4
CO5	Determine the biosafety aspects and assess the risks associated with products derived from biotechnology; and regulation of such products	5
CO6	Determine the importance of primary containment of biohazards. Compile various biosafety levels and explain the recommended biosafety levels for infectious agents and infected animals.	4,5,6
Title of the Course and Course Code	**Research Methodology (Elective) (BTH4213)**	**Number of Credits : 04**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
CO1	Describe various research methods like quantitative, qualitative and data collection and sampling methods.	1
CO2	Discuss various phases of scientific enquiry like problem identification, study and experimental design and data analysis.	2
CO3	Demonstrate how research is designed from building a hypothesis to data collection and designing controls.	3
CO4	Compare qualitative and quantitative research methods.	2,4,5
CO5	Perform statistical tests for analyzing data.	6
CO6	Apply and test various mathematical models for multivariate analysis.	3,5
S.Y. M.Sc. Semester III		
Title of the Course and Course Code	**Genomics and Proteomics - (BTH5301)**	**Number of Credits : 04**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
CO1	State concepts related to genome organization, mapping, annotation and sequencing strategies. Enlist databases and bioinformatic tools for analysis of whole genomes and proteomes.	1
CO2	Outline the concept of proteomics and discuss its applications. Explain advantages and limitations of structural and functional proteomics, Discuss current trends in proteomics.	2
CO3	Illustrate protein identification and separation strategies. Categorize experimental and computational methods of protein-protein interaction study, illustrate mass spectrometry and its applications in proteomics.	3
CO4	Explain peptidomics, toxicoproteomics, biomarkers in disease diagnosis, identification and characterization of novel proteins.	4
CO5	Compare various transcriptomics technologies and discuss the advantages and limitations of various investigative techniques	5
CO6	Integrate genomic strategies in identification of novel proteins, molecular diagnosis and discovery of drugs.	6

Title of the Course and Course Code	**Stem Cell Biology, Regenerative Medicine and Applied Biotechnology (BTH5302)**	**Number of Credits : 04**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
CO1	Outline the concept of differentiation, plasticity & trans differentiation	1
CO2	Discuss the properties of stem cells and apply the knowledge in regenerative medicine	2,3
CO3	Interpret how tissue organization *in vivo* and design a protocol to generate 3D tissue construct to be applied in tissue engineering.	2,6
CO4	Explain the concept of Biopharmaceuticals and compare with traditional pharmaceuticals	4,5
CO5	Explain the application of biotechnology in detection and therapy of cancer and assess the application, side effects and limitation of various methods	4,5
CO6	Cite and evaluate the Regulations, Controversies and shortcomings of stem cells and regenerative medicine	1,6
Title of the Course and Course Code	**Industrial Biotechnology-II and Bioinformatics - (BTH5303)**	**Number of Credits : 04**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
CO1	Explain the large-scale manufacturing and recovery processes of fermentation products of various sectors	4
CO2	Illustrate roles and responsibilities of Quality assurance and control departments and Demonstrate fundamental quality control techniques used in Industry.	3
CO3	Define and discuss the common terms used in Bioprocess economics	1
CO4	Evaluate the use of various bioinformatics tools and techniques and for the analysis of the biological experimental data.	5
CO5	Plan the study of various databases and tools for in silico analysis and data mining.	6
CO6	Discuss the importance of IPR in Biotechnology	2

Title of the Course and Course Code	**Biotechnology Practical- V Exercises in Stem Cell Biology, Regenerative Medicine, Applied Biotechnology and IPR (BTH5304)**	**Number of Credits : 04**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
CO1	Outline the procedure for primary culture and perform the initiation and maintenance of chick embryo culture.	1
CO2	Discuss the concept of aseptic techniques and execute subculture procedure without contamination.	2
CO3	Use the online search on patents and design the claims in the patents.	3
CO4	Explain the concept tissue engineering and review the Indian Scenario in Tissue Engineering.	4
CO5	Determine the effect on cell growth by performing cytotoxicity assays.	5
CO6	Design and conduct a survey on cancer epidemiology and available treatments.	6

Title of the Course and Course Code	**Exercises in Industrial Biotechnology-II and Bioinformatics (BTH5305)**	**Number of Credits : 04**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
CO1	Design experiment to perform Lab scale production, recovery and assay and operate Lab Bench fermenter	6
CO2	Perform lab scale solid state fermentation and recover a product	6
CO3	Demonstrate lab scale production of microbial cells, Ethanol/enzyme and Sauerkraut and sterility testing technique	3
CO4	Retrieve information from online biological databases and identify the similarity searching using BLAST and FASTA	1
CO5	Explain the basic structure visualization using Deep View	2
CO6	Analyse the output of various protein structure prediction and Molecular Docking tools and compare it with std. results.	4

Title of the Course and Course Code	**Analytical Techniques (BTH5306)**	**Number of Credits : 04**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
CO1	State the physicochemical properties and principles used in these techniques.	1
CO2	Explain basic features and components of different spectrometers.	2
CO3	Illustrate experimental details of techniques.	3
CO4	Analyze and interpret the results.	4
CO5	Evaluate the advantages and limitations of these techniques.	5
CO6	Design a quality assurance scheme in terms of standard operating procedure for maintenance of instruments.	6
Title of the Course and Course Code	**Food Technology (BTH5307)**	**Number of Credits : 04**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
CO1	Classify food and outline the concept of Specialty foods, Nutraceuticals, health foods and functional foods	1, 3
CO2	Discuss food adulterants and toxicants	2
CO3	Explain the factors affecting growth of microorganisms in food and food borne diseases.	4
CO4	Describe methods used for Food Processing and packaging	1
CO5	Design newer techniques used to detect microbial food spoilage and Review Food laws and legislations, HACCP	5,6
CO6	Perform analysis for food composition and detection of adulterants	6
Title of the Course and Course Code	**Nanotechnology (BTH5308)**	**Number of Credits : 04**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
CO1	Define the common terms used in Nanotechnology and discuss types and properties of nanoparticles	1,2
CO2	Explain the physical, chemical and biological methods of synthesis of nanoparticles.	4

CO3	Outline and describe methods used for characterization of Nanomaterials	1,3
CO4	Review the applications of nanomaterials in different fields	5
CO5	Perform synthesis of nanoparticles by various methods	6
CO6	Demonstrate biological activity of synthesized nanoparticles	3
Title of the Course and Course Code	**Bio entrepreneurship Development (BTH5310)**	**Number of Credits : 04**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
CO1	Outline the concept of Bio entrepreneurship development	1
CO2	Discuss various types of entrepreneurships, various motivational theories of entrepreneurship and policies of government.	2,3
CO3	Define various steps for project proposal identification and selection of projects; project report: contents and formulation.	2,6
CO4	Explain the concept enterprising management, HR concepts, basics of accounting and marketing, legal forms of business, how to manage capital and raise it.	4,5
CO5	Understand methods of evaluation of project proposal evaluation	4,5
CO6	Discuss the role of government agencies in entrepreneurship and various funding opportunities available through government and private investors.	1,6
Title of the Course and Course Code	**Biotechnology Elective Paper-2 – Biostatistics (BTH5311)**	**Number of Credits : 04**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
CO1	Recall the basic concepts in biostatistics.	1
CO2	Interpret the pattern observed in the data.	2
CO3	Carry out experiments to collect data.	3
CO4	Analyse the collected data to test hypotheses.	4
CO5	Conclude the results obtained by testing the hypotheses.	5
CO6	Formulate research questions using the acquired knowledge and skillset.	6

Title of the Course and Course Code	**Computational tools in research - (BTH5312)**	**Number of Credits : 02**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
CO1	Report and organise research content using MS Word and its formatting tools.	1
CO2	Discuss various technology based communication tools, netiquettes for effective e-mail messages, video conferencing, etc.	2
CO3	Demonstrate data tabulation, calculations and equations using MS excel.	3
CO4	Analyse biological research data using statistical tools.	4
CO5	Review other modes of presentation like Poster, Model exhibits and Popular Science articles.	5
CO6	Organize presentation material and prepare PowerPoint presentations.	6
Title of the Course and Course Code	**Emerging Trends and Technologies - (BTH5313)**	**Number of Credits : 02**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
CO1	Outline basics of latest technologies in area of biotechnology.	1
CO2	Discuss principles of several new technologies employed by researchers	2
CO3	Explain the working of equipment/instrument used in current technologies	4
CO4	Review the applications of the technologies in different fields	5
CO5	Write and Explain one application in depth	4,6
CO6	Apply the current day research tool kit as per requirement	3

S.Y. M.Sc. Semester IV		
Title of the Course and Course Code	**Project - (BTH5401)**	**Number of Credits : 10**
On completion of the course, the students will be able to:		**Bloom's Cognitive level**
CO1	Identify the research query	1
CO2	Interpret the data available in literature and identify the objectives of study undertaken.	2
CO3	Outline an experimental plan to gets answers to the research query	3
CO4	Explain the observations of the experiment to relate them to the objectives of the study	4
CO5	Analyse the results and validate the experiments	5
CO6	Propose the overall outcomes of the study and comment on the plan to strengthen the study further	6