MINUTES OF THE FIFTEENTH BOARD OF STUDIES MEETING

Faculty: Biosciences **Board: Biotechnology**

The Meeting of Board of Studies (BoS) was held as given below:

Name of the Body	**BoS**
Department	**Biotechnology**
Meeting No.	**15th**
Date and Time	**10.06.2023**
Venue	**Instrumentation Room, No.1213**
Members Attended	**The details are given in the ANNEXURE -I**

AGENDA	
1.	Discussion on UG syllabi for Part III – Core Courses in Third Semester for 2022-23 Batch
2.	Discussion on UG curriculum and syllabi for Part III – Core Courses in First Semester for 2023-24 Batch
3.	Discussion on Part – I (Tamil/Hindi/French/Malayalam) offered by Language Departments for 2022-23 Batch
4.	Discussion on Part -II (English) offered by English Department for 2022-23 Batch
5.	Discussion on PG syllabi in Third Semester courses for 2022-23 Batch
6.	Discussion on PG curriculum and syllabi for First Semester for 2023-24 Batch
7.	Discussion on PG DSE offered by Department of Biotechnology to other departments for 2022-23 Batch
8.	Discussion on PG Diploma syllabi in Second Semester courses for 2022-23 Batch
9.	Any other matter

MINUTES OF THE FOURTEENTH BOARD OF STUDIES MEETING

Faculty: Bioscience **Board: Biotechnology**

The Chairman of BoS welcomed all the Panel members for the meeting. The items listed in the agenda were taken for discussion.

The following are the minutes of the meeting:

Item - 01	Discussion on UG syllabi for Part III – Core Courses in Third Semester for 2022-23 Batch.
Discussion	**Part III :223BT1A3CA : Molecular Biology** Dr. Nakkeeran and Dr. Prasad suggested to include the following topics for a better understanding in basic concepts in Molecular Biology • Unit I: Small interfering RNA(Si), Micro RNA (Micro RNA), Satellite RNA and Small Nuclear RNA (Sn) • Unit V: Remove Mutation topic and to add Epigenetic Modifications. • Include websites URL in reference **Part III :223BT1A2CB :Biodiversity** Dr. Nakkeeran and Dr. Prasad suggested to include the following in references to know recent developments • Include websites URL in reference **223BT1A3SP – Skill Enhancement Course: Biotechniques** Dr. Nakkeeran and Dr. Prasad suggested to include the following experiment to enrich the basic skills & to become an entrepreneur. • Repairing and Calibration of instruments
Resolution	The Board members approved the above syllabi.
Item - 02	Discussion on UG curriculum and syllabi for Part III – Core Courses in First Semester for 2023-24 Batch
Discussion	R5 regulation for the academic year 2023-24 and the syllabus for Part -III core courses in first semester was discussed. No change is required in existing syllabi.
Resolution	The Board unanimously approved the curriculum and syllabi.
Item - 03	Discussion on Part – I (Tamil/Hindi/French/Malayalam) offered by Language Departments for 2022-23 Batch
Discussion	**Part I:** **221TL1A3TA: Tamil-III** **221TL1A3HA: Hindi-III** **221TL1A3FA: French-III** **221TL1A3MA:Malayalam – III** The unified syllabus approved by the Board of Studies in Languages was placed for endorsement.
Resolution	The Board unanimously approved the syllabi.

Item - 04	Discussion on Part -II (English) offered by English Department for 2022-23.
Discussion	**Part II: 221EL1A3EA: English III** The unified syllabus approved by the Board of Studies in English was placed for endorsement.
Resolution	The Board unanimously approved the syllabus.
Item – 05	Discussion on PG syllabi in Third Semester courses for 2022-23 Batch
Discussion	The courses of III semester of M.Sc. Biotechnology Batch: 2022 – 23were discussed in the board. Dr. Nakkeeran and Dr. Prasad suggested to include few topics the enhancement of recent advances in the following courses **223BT2A3CA – Research Methodology & IPR** • Unit I: Remove Source and include primary and Secondary data **223BT2A3CB – Genomics and Proteomics** • Unit I: Homology searching and annotation of genomic sequences. • Unit II: DNA Sequencing Technologies - Sanger sequencing- Next-generation sequencing (NGS) platforms, Single-molecule sequencing technologies and Preprocessing and quality control of NGS data • Unit-III: Genomic Data Analysis - Data quality control and preprocessing, Genome assembly, predicction and annotation, Variant calling and analysis, Comparative genomics, 18S rRNA and phylogenetics, Molecular simulation. • Unit -IV: Protein Data visualization and interpretation, Q-TOF, Orbitrap Quantitative Proteomics - Label-based techniques (SILAC, iTRAQ, TMT) Label-free techniques (MS1-based, MS2-based, spectral counting. • Unit V: Medical genomics and personalized medicine, Integration of multi-omics data. Functional proteomics and drug discovery. Epigenomics and Epigenetics **223BT2A3CC – Marine Biotechnology-** A new Course was introduced **223BT2A3CD – Plant Biotechnology** • Unit I: Introduction, Laboratory organization, media composition (MS, LS, White's, Knudson C), Sterilization techniques. Micropropagation (Callus, Nodal, Shoot tip, Meristem). Somatic embryogenesis, Artificial seed production, Haploid culture (Anther, Pollen, ovary, ovule). Protoplast isolation and somatic hybridization. Secondary metabolite production- suspension culture. Germplasm conservation- cryopreservation. **223BT2A3CE – Animal Biotechnology** • Unit I: Planning and Construction of ATC lab - organization of equipment – Dos and donts of ATC labs. • Unit II: Cryopreservation – protocol – lab requirements – ATCC the global bioresource • Unit V: 3D bioprinting – characteristics -requirements - types – advantages and limitations.

	223BT2A3CP - Core Practical: Plant, Animal, Marine Biotechnology, Genomics and Proteomics - A new Practical course was introduced
Resolution	The Board unanimously approved the syllabi.
Item - 06	Discussion on PG curriculum and syllabi for First Semester for 2023-24 Batch
Discussion	R5 regulation for the academic year 2023-24 and the syllabus for the courses in first semester were discussed. No change is required in the existing syllabi.
Resolution	The Board unanimously approved the curriculum and syllabi.
Item -07	Discussion on PG DSE offered by Department of Biotechnology to other departments for 2022-23 Batch
Discussion	Dr. Nakkeeran and Dr. Prasad suggested to include following topics for better understanding **223BT2A3DA – Molecular Therapeutics** • Unit I: Introduction to the gene therapy • Unit II: Introduction to cellular therapy, Role of adult and embryonic stem cells in therapy. Role of growth factors in tissue engineering. • Unit III: Introduction to Recombinant therapy • Unit V: MAMP, RAMP and DAMP triggered immunity
Resolution	The Board unanimously approved the syllabus
Item -08	Discussion on PG Diploma syllabi in Second Semester courses for 2022-23 Batch
Discussion	Dr. Nakkeeran and Dr. Prasad suggested to follow the existing syllabi
Resolution	The Board unanimously approved the syllabi
Item -09	Any other matter
Discussion	The board members discussed the Panel of Examiners
Resolution	The Board unanimously approved the Panel

The chairman of Board of Studies (BoS) thanked all the members for their active participation and providing their valuable suggestions.

10/6/23

Date: 10.06.2023

(Dr. P. Chidambara Rajan)

BoS Chairman/HoD
Department of Biotechnology
Dr. N. G. P. Arts and Science College
Coimbatore – 641 048

B.Sc. Biotechnology
Syllabus Revision

Faculty: Biosciences **Board: Biotechnology**

Semester: III

Course Code/Name: 223BT1A3CA/ Molecular Biology

Unit	Existing	Revised
I	Discovery of DNA as genetic material - Griffith's experiment, Avery, Macleod and McCarty Experiment and Hershy and Chase experiment. Structure of Nucleoside and Nucleotide. Structure of DNA (Watson and Crick Model), Types of DNA (A- DNA, B-DNA and Z- DNA). Structure and Types of RNA (mRNA, tRNA and rRNA).	Structure and Types of RNA (mRNA, tRNA andrRNA)Small interfering RNA(Si), Micro RNA(Micro RNA), Satellite RNA and Small Nuclear RNA (Sn).
II	Over view of Central dogma, Experimental proof for Semi conservative method. Enzymes & accessory proteins involved in DNA replication. Replication process in prokaryotic & Eukaryotic DNA. Differences between Prokaryotic and eukaryotic replication. Rolling circle model of replication.	-
III	Importance of DNA binding Proteins, RNA polymerase. Mechanism of Transcription in prokaryotes & Eukaryotes. Differences between Prokaryotic and eukaryotic transcription. Post transcriptional Modifications in RNA - 5' cap formation, 3'-end polyadenylations. Splicing and Processing of m- RNA, r-RNA & t- RNA. Transcriptional regulation in prokaryotes – *lac* operon and *trp* operon.	3'-end polyadenylation (Poly A tail).
IV	Overview of Genetic code, wobble hypothesis. Mechanism of translation in Prokaryotes& Eukaryotes. Post translational modifications of proteins- Phosphorylation, Deformylation, Glycosylation, Acetylation, Amidation, Lipid attachment, S - Nitrosylation and Disulfide bond formation. Translational inhibitors.	-
V	~~Mutation: Types of Mutation, Mutants (Physical and Chemical).~~ DNA repair mechanism-Nucleotide excision, base excision, Mismatch repair, Photo reactivation, SOS and recombination repair.	Epigenetic Modifications

Percentage of Syllabus Revision **10%**

Course Focus on :

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

Core Practical Syllabus Revision-New Course

Faculty: Bioscience **Board: Biotechnology**
Semester: III
Course Code/ Name: 223BT1A3CP – Core Practical - III: Molecular Biology and Biodiversity

Exp. No.	Content
1.	Isolation of DNA from Plant
2.	Isolation of DNA from Animal tissue
3.	Isolation of DNA from Bacteria
4.	Isolation of Plasmid from Bacteria
5.	UV mutagenesis
6.	Transformation
7.	Preparation of Herbaria – Five families (1 Plant from each family) with Authentication from authorized agencies*
8.	Field visits to nearby Zoo, Forest, Nursery, and Culture collection centre – Herbaria/Botanical Garden*
9.	Introduction to Biodiversity Database-IBIN
10.	Preparation and Digitalization of Insects and Calculation of Species richness by line and plot analysis*
11.	Prepare an audio-visual presentation about conservation to the youth & general public on some environment issues (e.g. Destruction of local biodiversity site like lakes, ponds or a forest patch, Human-wildlife conflict, Developmental activity that has potential threat to local biodiversity.) Minimum of 10 minutes duration.

COURSE FOCUS ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
	Intellectual Property Rights		Gender Sensitization
✓	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

Syllabus Revision (Embedded SEC)-New Course

Faculty: Bioscience **Board: Biotechnology**
Semester: III

Course Code/ Name: 223BT1A3SP – SEC I: Biotechniques

Exp. No.	Content
1.	Laboratory Safety, rules and regulations.
2.	Working Principles of Laminar Air Flow, Autoclave, Hot Air Oven and Incubator
3.	Principles and types of centrifugation
4.	Study of UV absorption spectra of macromolecules (protein, nucleic acid,) - Colorimeter and Spectrophotometer
5.	Standardization of pH meter using standard buffers
6.	Buffer preparations
7.	Separation of amino acids by TLC and Paper Chromatography
8.	Separation of Proteins/Nucleic acids by gel electrophoresis
9.	Quantification of Proteins/Nucleic acids by Nanodrop
10.	HPLC and HPTLC - Demo
11.	Lab Visits - KMCH, SITRA, DRDO, Central Instrumentation Centre - BU, IFGTB
12.	Repairing and Calibration of instruments

COURSE FOCUS ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
	Intellectual Property Rights		Gender Sensitization
✓	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

M.Sc. Biotechnology

Syllabus Revision

Faculty: Biosciences **Board: Biotechnology**

Semester: III

Course Code/ Name: 223BT2A3CA/ Research Methodology & IPR

Unit	Existing	Changed
I	Definition of Research, Qualities of Researcher, Components of Research Problem, Various Steps in Scientific Research, Types of Research; - Research Design. Sampling- Types of sampling - design - procedure - Data: Meaning ~~- Source.~~	Primary and Secondary data
II	Scientific writing skills - Importance; Plagiarism; Scientific publication writing: Elements of a scientific paper including Abstract, Introduction, Materials &Methods, Results, Discussion, References; ~~Drafting titles and framing abstracts;~~ Publishing scientific papers - the peer review process and problems	-
III	Structure and Components of Research Report, Types of Reports, Styles of reporting, Steps in drafting reports, editing and evaluation of final draft, ~~evaluating the final draft.~~ Pictures and Graphs; Research proposal/ Grant-definition, structure, budget allocation, specific aims, background and significance. Hierarchy of funding agencies in India and their operations.	-
IV	Types of IP; Importance of IPR; Patents, Trademarks, Copyright and Related rights, Industrial Design; Traditional knowledge; Geographical indications; Patent life, Legal protection of biotechnological inventions; World Intellectual Property Rights Organization (WIPO); Protection of GMOs; Relevance of IP in Biotechnology.	-
V	History of Indian Patent System and Law; Patent file procedures; Types of Patent; Status of the patent applications; Precautions during patenting; Patentable and Non-Patentable items; Patent cooperation treaty (PCT); Patent and compulsory licensing. Indian Patent Act 1970 and Recent Amendments; GATT and TRIPS agreement; WIPO Treaties.	-

PERCENTAGE OF SYLLABUS REVISED: 7%

COURSE FOCUS ON

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
✓	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

Syllabus Revision

Faculty: Biosciences **Board: Biotechnology**

Semester: III

Course Code/ Name: 223BT2A3CB/ Genomics and Proteomics

Unit	Existing	Changed
I	Bioinformatics – Introduction and History. Biological Databases. Primary and secondary databases with examples. Data generation - large scale molecular biology data, BIOSEQ. Nucleic acid sequence databases: Gene bank, Protein sequence databases - Swiss-Prot, PDB & PIR. Rasmol - Molecular modeling. Steps to retrieve sequence and structure of a protein. Applications of Bioinformatics.	Homology searching and annotation of genomic sequences.
II	Introduction and classification of genomics- Functional genomics, structural genomics. Sequencing of genomes and sequencing methods (next- generation sequencing). Structure, organization and composition of prokaryotic genomes. Microbial genomics and genome epidemiology. Metagenomics and methods of Metagenomics.	DNA Sequencing Technologies - Sanger sequencing Next-generation sequencing (NGS) platforms, Single-molecule sequencing technologies and Preprocessing and quality control of NGS data
III	Genome analysis of Microbes, plants and animals; Accessing and retrieving genome project information from web; Comparative genomics, Identification and classification using molecular markers-16SrRNA typing/sequencing, Fragment Assembly- ESTs, Next Generation Sequencing, Gene predictions. Codon optimization tools and its advantages. Microarray and its applications. Gene Expression Profiling. GENSCAN. Molecular docking & Molecular simulation principles.	Genomic Data Analysis - Data quality control and preprocessing, Genome assembly, prediction and annotation, Variant calling and analysis, Comparative genomics,18S rRNA and phylogenetics Molecular simulation
IV	Protein analysis - Proteomics classification. 1D-SDS-PAGE and 2D-SDS PAGE. Detection and quantitation of proteins in gels. Pros and cons of various staining methods. Basics of mass spectrometry. MALDI - TOF and ESI and their application in proteomics. UPLC and its applications. Tandem MS/MS spectrometry - Peptide sequencing by tandem mass spectrometry - Affinity purification of protein - TAP tag.	Protein Data visualization and interpretation Q-TOF, Orbitrap Quantitative Proteomics - Label-based techniques (SILAC, iTRAQ, TMT) Label-free techniques (MS1-based, MS2-based, spectral counting
V	High content screening in genome for drug discovery-identification of gene targets Pharmacogenetics; Pharmacogenomics - classical and non- classical. Pharmacogenomics of genetic diseases e.g. hypertension and Cancer. Metabolomics-techniques involved. Nutrigenomics and its applications. Other omics - lipidomics, transcriptomics, metagenomics, toxicogenomics, venomics and its applications. Basics of CADD, its importance.	Medical genomics and personalized medicine Integration of multi-omics data. Functional proteomics and drug discovery. Epigenomics and Epigenetics

PERCENTAGE OF SYLLABUS REVISED: 36%

COURSE FOCUS ON

✓	Skill Development		Entrepreneurial Development
✓	Employability	✓	Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

Syllabus Revision - New Course

Faculty: Biosciences **Board: Biotechnology**

Semester: III

Course Code/ Name: 223BT2A3CC/ Marine Biotechnology

Unit	Content
I	Introduction to marine environment-Marine Flora - Phytoplankton, seaweeds, sea grasses and mangroves. Marine fauna - Zooplankton- Marine invertebrates (crustaceans & sponges)- Vertebrates -Fishes (bony, cartilaginous, jawless fishes) -Marine tetrapods (amphibians, reptiles)- marine mammals (dolphin and whales). Bio-communication in oceans, Microbe-microbe interaction, Quorum quenching, Maring Biofouling.
II	Marine Biotechnology- applications of marine biotechnology (marine natural medicinal products (Antibiotic, Antitumor Compounds and Peptides) - Marine Neutraceuticals (Marine Lipids, Marine Probiotics and Marine Pigments), Marine cosmetics (Marine active ingredients for moisturizing, skin ageing and topical protection) and Metabolic engineering of microalgae for biofuel production.
III	Transgenic fish production- Techniques used- Microinjection, Electroporation and Retroviral Vector. Sterile fish production; Artificial insemination - in vitro fertilization. Issues or Concerns related to Transgenic Fish. Measures to resolve issues in research and safety. Gene manipulations to improve strains. Hormonal influence in fish breeding technology.
IV	Fish and Shrimp Diseases: Bacterial, fungal, viral and parasitic (EHP, WSSV, RMS, WFS). Gene probes. Molecular diagnosing – Fluorescent in-situ hybridization (FISH), Polymerase Chain reaction (PCR). Microarray diagnosis. Detection of toxic substances and pathogenic microbes- biosensors for toxin detection- Antibiotic residual analysis techniques. Recent advancements in fish vaccines preparation, probiotics, prebiotics, antimicrobial peptides. Natural preservatives used for preservation of fish.
V	Biotechnology applications in Aquaculture, Ornamental fish, Biotechnological approaches for production of important microalgae. Micro-algae- indoor and mass-culture methods. Single cell protein from Spirulina, vitamins, minerals and Omega-3 fatty acids from micro-algae; enrichment of micro-algae with micronutrients; cell wall polysaccharides of micro-algae, micro algae biomass for removal of heavy metals. Green fluorescent protein (GFP) & red fluorescent protein (RFP) characteristics and their applications, Green mussel adhesive protein, Chitosan and its applications Conservation and management-in situ and ex situ, IUCN categorization; Marine biosphere reserves; Marine parks - heritage sites.

COURSE FOCUS ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
✓	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

Syllabus Revision

Faculty: Biosciences **Board: Biotechnology**

Semester: III

Course Code/ Name: 223BT2A3CD/ Plant Biotechnology

Unit	Existing	Changed
I	Media, plant growth regulators: Callus and suspension culture, somoclonal variation, somatic embryogenesis: Embryo culture, micropropagation protoplast isolation and somatic hybridization; Haploid plants, Artificial seeds and hardening. Germplasm preservation- cryopreservation.	Introduction, Laboratory organization, media composition (MS, LS, White's, Knudson C), Sterilization techniques. Micropropagation (Callus, Nodal, Shoot tip, Meristem). Somatic embryogenesis, Artificial seed production, Haploid culture (Anther, Pollen, ovary, ovule). Protoplast isolation and somatic hybridization. Secondary metabolite production- suspension culture. Germplasm conservation- cryopreservation.
II	Nuclear genome, chloroplast genome, mitochondrial genome, CMS, Protein targeting to chloroplast and mitochondria, Heat shock proteins, seed storage proteins.	-
III	Features of Ti and Ri plasmids, uses of Ti and Ri as vectors, binary vectors, use of 35S and other promoters, viral vectors, use of reporter genes, Transgenic biology - methods of nuclear transformation – physical, chemical and biological gene transfer methods in plants.	-
IV	Engineering of plants for herbicide resistance, insect resistance, disease resistance, antifungal proteins, nematode resistance, stress tolerant plants, Molecular Breeding, Genome editing techniques for crop improvement - Long shelf life of fruits and flowers – antisense RNA technology, Green house technology.	-
V	Extraction & purification of phyto- chemicals. Industrial phytochemical products from plants- Alkaloids, Biodegradable Plastics, Therapeutic proteins, plantibodies, plant vaccines, herbal drugs, bioethanol and biodiesel.	-

PERCENTAGE OF SYLLABUS REVISED: 27%

COURSE FOCUS ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

Syllabus Revision

Faculty: Biosciences **Board: Biotechnology**
Semester: III

Course Code/Name: 223BT2A3CE / Animal Biotechnology

Unit	Existing	Revised
I	Structure and organization of animal cells – culture media, balanced salt solution and simple growth medium, physical m chemical and metabolic functions of different constituents of culture medium; role of carbon dioxide, serum, growth factors, glutamine in cell culture, serum and protein free defined media and their applications.	Planning and Construction of ATC lab - organization of equipment – Dos and donts of ATC labs.
II	Primary cell culture techniques – mechanical disaggregation, enzymatic disaggregation, separation of viable and nonviable cells. Mass culture of cells – manipulation of cell line selection – types of cell lines – maintenance of cell lines – immobilization of cells and its application – synchronization of cell cultures and cell division – cryopreservation – germplasm conservation.	Cryopreservation – protocol – lab requirements – ATCC the global bioresource
III	Scale up in suspension – stirrer culture, continuous flow culture, air lift fermentor culture, scale up in monolayer – Roller bottle culture, mutisurface culture, multiarray disks, spiral sand tubes – monitoring of cell growth. Organ culture – whole embryo culture – specialized culture techniques – measurement of cell death.	-
IV	Advantages and limitations of Tissue and organ culture – medical/pharmaceutical products of animal cell culture- genetic engineering of animal cells and their applications. Risks in a tissue culture lab and safety- biohazards. Facilities for animal cell culture – infrastructure, equipment, culture vessel.	-
V	Design and engineering of tissues – tissue modeling . Embryo stem cell engineering – Es cell culture to produce differential cells – Human embryonic stem cell research. Transgenic animals – transgenic animals in xenotransplantation.	3D bioprinting – characteristics -requirements - types – advantages and limitations.

Percentage of Syllabus Revision: **16%**

Course Focus on :

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

Core Practical Syllabus Revision-New Course

Faculty: Bioscience **Board: Biotechnology**
Semester: III

Course Code/ Name: 223BT2A3CP – Core Practical -V: Plant, Animal, Marine Biotechnology, Genomics & Proteomics

Exp. No.	Content
1.	In vitro Seed Germination and Artificial Seed Production
2.	Callus Induction and Micropropagation
3.	Isolation and Fusion of Protoplast
4.	Agrobacterium mediated gene Transfer
5.	Preparation of primary cell culture & trypsinization
6.	Determining cell number and viability with a haemocytometer and trypan blue staining
7.	Detection of sea food associated pathogens
8.	Screening of marine micro organisms for production of antibiotics
9.	Extraction of Biomolecules from sea weeds
10.	Retrieving of nucleotide sequences and Construction of phylogenetic tree
11.	Retrieving structural data of a protein and a drug molecule
12.	Selection of target and ligand for molecular docking

COURSE FOCUS ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
	Intellectual Property Rights		Gender Sensitization
✓	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

Syllabus Revision

Faculty: Biosciences **Board: Biotechnology**

Semester: III

Course Code/ Name: 223BT2A3DA/ Molecular Therapeutics

Unit	Existing	Changed
I	Gene Therapy, Drug targeting and drug delivery system. Intracellular barriers to gene delivery, ~~overview of~~ inherited and acquired diseases ~~for gene therapy~~, virus mediated gene transfer. Liposome and Nanoparticles mediated gene delivery	Introduction to Gene Therapy, gene therapy for inherited and acquired diseases
II	Cellular therapy; Stem cells: definition, properties and potency of stem cells; Sources: embryonic and adult stem cells; Concept of tissue engineering; Role of scaffolds; Role of growth factors; Role of adult and embryonic stem cells; Clinical applications; Ethical issues.	Introduction to Cellular therapy. Role of adult and embryonic stem cells in therapy. Role of growth factors in tissue engineering.
III	Recombinant therapy, Clinical application of recombinant technology, Erythropoietin, insulin analogs and its role in diabetes, Recombinant human growth hormone, streptokinase and urokinase in thrombosis. Recombinant coagulation factors	Introduction to Recombinant therapy.
IV	~~Factors predisposing to microbial pathogenicity,~~ types of infectious diseases. General concept of infectious disease, Progression of Infection and Disease -Entrance (Portal of entry), Colonization (Adherence; Adhesion; Attachment), Prevention of Host Defenses, Antigenic Variation, Penetration into Host Cytoskeleton, Damage to Host Cells, Production of Toxins	-
V	Phage and their application, Immunotherapy, Monoclonal antibodies and their role in cancer, role of recombinant interferons, Immunostimulant and Immunosupressors in organ transplants, role of cytokine therapy in cancer. Vaccines: types, recombinant vaccines and clinical applications	Introduction to Immunotherapy, Monoclonal antibodies and their role in cancer treatment. MAMP, RAMP and DAMP triggered immunity.

PERCENTAGE OF SYLLABUS REVISED: 29%

COURSE FOCUS ON

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

ATTENDANCE OF THE FIFTEENTH BOARD OF STUDIES MEETING

Faculty: Biosciences **Board: Biotechnology**

Date : 10/06/2023
Time : 10.00 a.m.
Venue : Department of Biotechnology (Room. No: 1213)

The following members were present for the Board of Studies meeting

S. No	Name	Designation	Signature
1.	Dr. P. Chidambara Rajan Professor and Head	Chairman	10/6/23
2.	Dr. V. Vijaya Padma Professor, Department of Biotechnology Bharathiar University, Coimbatore	University Nominee	ABSENT
3.	Dr. S. Nakkeeran Dean i/c, Agricultural College and Research Institute, Kudumiyanmalai, Pudukkottai	Subject Expert	10/06/23
4.	Dr. P.T. Prathima, Senior Scientist, Crop Improvement Division, ICAR-Sugarcane Breeding Institute, Coimbatore	Subject Expert	ABSENT
5.	Dr. M. Prasad R&D Executive – Industrial Enzymes Marisym Biologicals Private Limited, Coimbatore	Industrial expert	10/6/23
6.	Dr. N. Karthikeyan Project Coordinator, Regional Sericulture & Research Center, Salem	Alumni	ABSENT
7.	Mr. Deepesh Vasnani III B.Sc. Biotechnology	Student Representatives	ABSENT
	Ms. Dharani M II M.Sc. Biotechnology		M. Dharani
8.	Part I (Language I) Dr. N. Kuppuswamy Professor and Head Department of Tamil	Co-opted member	10/6/23

9.	Part II (Language II) Dr. R. Vithya Prabha Professor and Head Department of English	Co-opted member	10/6/23
10.	Allied - IDC- Chemistry Dr. M. Suganthi Assistant Professor and Head Department of Chemistry	Co-opted member	10.6.23
11.	Allied - IDC- Mathematics Dr. R. Sowrirajan Assistant Professor and Head Department of Mathematics	Co-opted member	
12.	Dr. R. Suganthi Professor	Internal Member	
13.	Dr. K. Arungandhi Professor	Internal Member	
14.	Dr. M.N. Kathiravan Professor	Internal Member	
15.	Dr. Arun. P Professor	Internal Member	10/6/23
16.	Dr. M.Shanmugavadivu Associate Professor	Internal Member	10/6/23
17.	Dr. M.Poongothai Associate Professor	Internal Member	10/6/23
18.	Dr. Radha Palaniswamy Assistant Professor	Internal Member	10/6/23
19.	Dr. S. Saranya Assistant Professor	Internal Member	10/6/23.
20.	Mrs. C.R. Aarthi Assistant Professor	Internal Member	10/6/23

10/6/23

(Dr. P. Chidambararajan)
BoS Chairman/HoD
Department of Biotechnology
Dr. N. G. P. Arts and Science College
Coimbatore – 641 048

Date: 10/06/2023

Academic Council
CHAIRMAN
Dr.N.G.P. Arts and Science College

9.	Dr. R. Vidya Padmini Professor and Head Department of Microbiology Allied - UDC - Chemistry	Co-opted member
10.	Dr. M. Sangeetha Assistant Professor and Head Department of Microbiology Allied - BTC - Mathematics	Co-opted member
11.	Dr. R. Sree Priya Assistant Professor and Head Department of Mathematics	Co-opted member
12.	Dr. R. Sugumthi Professor	Internal Member
13.	Dr. K. Arthipandhi Professor	Internal Member
14.	Dr. M.M. Kathiravan Professor	Internal Member
15.	Dr. Alam. P Professor	Internal Member
16.	Dr. K.Shanmugavadivu Associate Professor	Internal Member
17.	Dr. M.Thilagaba Associate Professor	Internal Member
18.	Dr. Radha Balasubramanya Assistant Professor	Internal Member
19.	Dr. S. Sumiya Assistant Professor	Internal Member
20.	Mrs. C.K. Akalya Assistant Professor	Internal Member

Date: 10/06/2023

(Dr. R. Vidya Padmini)
BoS Chairman/HoD
Department of Biotechnology
Dr. N. G. P Arts and Science College
Coimbatore – 641 048

Academic Council
Dr. N.G.P. Arts and Science College
CHAIRMAN