Dr. N.G.P. ARTS AND SCIENCE COLLEGE

(An Autonomous Institution, Affiliated to Bharathiar University, Coimbatore)
Approved by Government of Tamil Nadu & Accredited by NAAC with 'A++' Grade (3rd Cycle-3.64 CGPA)
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Department of Microbiology

Board of Studies Meeting

The minutes of the 17th meeting of Board of Studies held on 05.04.2024 at 10.00 am at the Microbiology Department, Instrumentation Room (B1-1302).

Members Present:

S. No.	Name	Category
1	Dr. J. Rengaramanujam	Chairman
2	Dr. M. Gnanadesigan – Assistant Professor, Department of Microbial Biotechnology, Bharathiar University, Coimbatore.	University Nominee
3	Dr. S. Murugan – Associate Professor, Department of Biotechnology, Karunya University, Coimbatore.	Subject Expert
5	Dr. N. Kuppuchamy	Co – Opted Member
6	Dr. A. Hazel Verbina	Co – Opted Member
7	Dr. S. Kokila	Co – Opted Member
8	Dr. S. Sowrirajan	Co – Opted Member
8	Dr. D. Geetharamani	Member
9	Dr. S. S. Sudha	Member
10	Dr. N. Vidhya - Professor	Member
11	Dr. S. Senthil Prabhu	Member
12	Dr. A. M. Ramachandran	Member
13	Dr. C. Sasikala	Member
14	Dr. S. Karthik Sundaram	Member
15	Dr. R. Mahenthiran	Member
16	Prof. M. Nivethitha	Member
17	Dr. J. Devakumar	Member
18	Sivaranjani. S	Student Representative
19	Thirisha. Y	Student Representative

The HoD and Chairman of the Department of Microbiology welcomed and introduced all the members and appreciated them for their continuous support and contribution for the development of academic standard and enrichment of the syllabus.

Further Chairman informed the inability of the following member/s to attend the meeting and requested to grant leave of absence due to their official commitment.

1. Dr. K. Vijila, Asso. Professor, Microbiology, TNAU, Coimbatore - Subject Expert
2. Dr. Chitra Tangavel, Scientist, Ganga Res. Center, Coimbatore -Industrial Expert
3. Ms. Durgadevi . S - Alumni

The items of the agenda were taken one by one for discussion and the following resolutions were passed.

Item 17.1 *To review and approve the minutes of the previous meeting held on* ***18. 10.2023***

The chairman of the Board presented the minutes of the previous meeting held on **18.10.2023** and requested the members to approve. After brief discussion the following resolution was passed

Resolution:

Resolved to approve the minutes of the previous meeting held on 18.10.2023

Item 17.2: *To review and approve the scheme, regulations and syllabus for the I Semester for the students admitted in UG and PG from academic year 2024-25*.

The chairman presented the detailed scheme and Regulation for the students admitted from the academic year 2024-25 onwards and syllabus for the I semester. The members deliberated in detail about the modification required. After discussion it is unanimously decided to adopt the following changes.

Changes Made:

B. Sc Microbiology		
Course Code	**Course**	**Reason**
24MBU1AA	Environmental Studies	Dr. M. Gnanadesigan and other department heads have recommended and accepted for revision in the syllabus content for bringing more awareness on conservation and conservation acts. **Unit I:** Energy flow and ecosystem and sustainable development. **Unit II:** Conflicts over water usage and drought. **Unit III:** In-situ and Ex-situ conservation of biodiversity. **Unit IV:** Environment Protection Act; Prevention & Control of Pollution Act – Air & Water. **Unit V:** Environmental ethics: Role of Indian and other religions and cultures in environmental conservation.
M. Sc Microbiology		
-	-	-

New Courses Introduced:

B. Sc Microbiology		
Course Code	**Course**	**Reason**
-	-	-
M. Sc Microbiology		
-	-	-

Courses Removed

B. Sc Microbiology		
Course Code	**Course**	**Reason**
-	-	-
M. Sc Microbiology		
-	-	-

After discussion the following resolution was passed.

Resolution:

Resolved to approve the above modification and adopt the revised scheme, regulation and syllabus for students admitted from the academic year 2024-25.

Item 17. 3 : *To review and approve syllabi for the III Semester for students admitted in UG and PG from the academic year 2023-24.*

The Chairman presented the detailed syllabi for the III semester to the students admitted for the academic year 2023-2024. The members deliberated in detail about the modification required. After discussion it is unanimously decided to adopt the following changes.

Changes Made:

B. Sc Microbiology		
Course Code	**Course**	**Reason**
-	-	-
M. Sc Microbiology		
-	-	-

New Courses Introduced:

B. Sc Microbiology		
Course Code	**Course**	**Reason**
233MB1A3CB	Microbial Genetics	Dr. M. Gnanadesigan suggested for introduction and introduced Microbial Genetics in third semester for having better understanding of molecular basis and genetics which will be helpful to have a better learning of genomics based diagnosis and research courses in ensuing semesters.
233MB1A3CP	Core Practical - Microbial Diversity and Microbial Genetics	Dr. Murugan recommended for reformation of the Core Practical as new one with focus on Microbial Genetics and Diversity and introduced to align and acquire the practical skills parallely.
233MB1ASSA	Pedagogy for Biology	Dr. Gnanadesigan and Dr. Murugan suggested that Teaching opportunities for microbiologists schools are encouraging where basic understanding of teaching methods through self learning will be a value addition in successful taping of the job opportunities in schools. It has been adopted as per the suggestion.

233MB1ASSB	Bio- Marketing	Members felt and agreed to introduce this paper where, significant number of graduates are becoming entrepreneurs/medical representatives. So understanding the basics of marketing skills will be helpful for graduates to become progressive marketing professional and successful entrepreneurs.
M. Sc Microbiology		
233MB2ASSA	Good Manufacturing Practices	The board members recommended and opted for this course as self study where graduate with aspiration to become quality assurance manager or entrepreneur will have an opportunity to explore various regulatory guidelines and authorities (Eg. FDA, FSSAI, Cartagena *etc*.,) in the field of food, pharma, beverages etc., manufacturing industries.
233MB2ASSB	Introduction to Human Anatomy	The course has been introduced as per the suggestion given by student representatives and alumni feedback to increase the scope of employability in medical coding/transcription and chance of taping competitive examinations like UGC/CSIR NET, GATE, SET etc.,

IDC offered

Course code	Course	Reason
-	-	-

Courses Removed

B. Sc Microbiology		
Course Code	**Code**	**Reason**
233MB1ASSA	Good Laboratory Practices	These course contents have been substantiated in core, elective and skill enhancement courses like Pharmaceutical Microbiology, Microbiology Lab Accreditation, Dairy Microbiology, Food and Water Quality Analysis and Food Microbiology (Embedded) requiring for removal as per suggestion of Dr. Murugan.
233MB1ASSB	Food Sanitation	
M. Sc Microbiology		
-	-	-

After discussion the following resolution was passed with the above changes and modifications.

Resolution:

Resolved to approve the above modification and adopt the revised syllabi for students admitted from the academic year 2023-24.

Item 17.4: *To review and approve syllabi for the V Semester for students admitted in UG from the academic year 2022-23.*

The Chairman presented the detailed syllabi for the V semester for the students admitted from the academic year 2022-2023. The members deliberated in detail about the modification required. After discussion it is unanimously decided to adopt the following changes.

Changes Made:

B. Sc Microbiology		
Course Code	**Course**	**Reason**
223MB1A5CA	Medical Bacteriology	**Unit V:** Dr. S. Murugan insisted on bringing the antimicrobial resistance topics **MRSA, VRSA, MDRB and PDRB** among bacterial strains which have been added with implications and its control.
223MB1A5CB	Virology	**Unit I:** Dr. Gnanadesigan suggested emphasizing more on the **general characteristics of viruses** than focusing on history. So morphological characteristics has been included.

New Courses Introduced:

B. Sc Microbiology		
Course Code	**Course**	**Reason**
223MB1A5CC	Mycology and Parasitology	Dr. M. Gnanadesigan suggested to introduce the subject Mycology and Parasitology for graduates being an upskilled health officer with understanding in fundamentals of fungal and parasitic infection mechanism and its prophylactic measures. It helps in deciphering the root cause of community infection and its control.
223MB1A5CD	Advanced Diagnostic Microbiology	Dr. Murugan recommended introducing the course on Advanced Diagnostic Microbiology and board accepted for the same to have up-leveled employable diagnostic lab personal for exploring the recent molecular diagnostic techniques for rapid and precise diagnosis of emerging infectious diseases.
223MB1A5SA	Microbial Fermentation	Dr. M. Gnanadesigan emphasized to incorporate fermentor design and its types for having an in depth knowledge in fermentation industry. It has been done so.

223MB1A5DA	Microbial Products and Process	To expose the learners to commercially available microbial products leading to enhanced understanding of entrepreneurial opportunities and to become bio-entrepreneurs, Dr. Murugan recommended for introducing this course and implemented so.
223MB1A5DB	Dairy Microbiology	Dr. M. Gnanadesigan suggested to introduce the course and done so for producing skilled dairy microbiologists in production industry to cater the scope of employability in dairy industries.
223MB1A5DC	Communicable Diseases	Members suggested and opted for the course to have better understanding of the community infections and control which will enable the microbiologist to play a key role in policy making and public health administration.

Resolution:

Resolved to approve the above modification and adopt the revised syllabi for students admitted from the academic year 2022-23.

Item 17.5: *To review and approve the Certificate/Skill oriented courses to be offered during the academic year 2024-25.*

The following Value Added Certificate Course is to be offered in the Even semester by internal faculty for interested students belonging to all batches from our department and across disciplines

- **Lab safety and First Aid**
- **HACCP in Food Industry**
- **Spirulina Production and its value addition**
- **Medical underwriting and Summarization**

Resolution:

Resolved to approve the Value Added Certificate Courses for the academic year 2024-2025.

Item 17.6: *To approve the panel of examiners for Question paper setting and evaluation of answer scripts for the odd semester of the academic year 2024-25.*

The Chairman presented the panel of Examiners for question paper setting, question paper scrutiny and conduct of practical and theory of examinations are Submitted to CoE for Exam related work.

Resolution:

Resolved to approve the panel of examiners for question paper setting and evaluation of answer scripts for the even semester of the academic year 2024-2025.

Item 17.7: *Any other Item.*

No other item was brought forward.

Finally the Chairman thanked all the members for their cooperation and contribution in enriching the syllabus with active participation in the meeting and sought the same spirit in the future also. The meeting was closed with formal vote of thanks proposed by Dr. J. Rengaramanujam, Head and Chairman – Microbiology.

Date: 05.04.2024

(Dr. J. Rengaramanujam) 5/4/2024

BoS Chairman/HOD
Department of Microbiology
Dr. N. G. P. Arts and Science College
Coimbatore - 641 048

Syllabus Revision

Faculty: Biosciences **Board: Microbiology**

Semester: I

Course Code/ Name: 24MBU1AA / Environmental Studies

Unit	Existing	Changes
I	Introduction to Environmental studies& Ecosystems: ~~Multidisciplinary nature of environmental studies;~~ components of environment – atmosphere, hydrosphere, lithosphere and biosphere. Scope and importance; ~~Concept of sustainability and sustainable development. Ecosystem Structure and function of ecosystem;~~	Energy flow in an ecosystem: food chain, food web and ecological succession.
II	Natural Resources: Renewable and Non-renewable Resources: Land Resources and land use ~~change; Land degradation, soil erosion and desertification~~. Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations. ~~Water: Use and overexploitation of surface and ground water, floods, droughts,~~. Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs.	Conflicts over water usage and drought
III	Biodiversity and Conservation: ~~Levels of biological diversity: genetic, species and ecosystem diversity; Biogeography zones of India; Biodiversity patterns and~~ Global biodiversity hot spots. India as a mega-biodiversity nation; Endangered and endemic species of India. ~~Threats to biodiversity: habitat loss, poaching of wildlife, man wildlife conflicts, biological invasions;~~	Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.
IV	Environmental Pollution, ~~Environmental Policies & Practices: Environmental pollution:~~ types, causes, effects and controls; Air, water, soil, chemical and noise pollution. Nuclear hazards and human health risks. ~~Solid waste management: Control measures of urban and industrial waste. Pollution case studies.~~Environment Laws: Wildlife Protection Act; Forest Conservation Act;	Environment Protection Act; Prevention & Control of Pollution Act – Air & Water.
V	~~Human Communities and the Environment & Field Work: Human population and growth: Impacts on environment, human health and welfares..~~ Role of Information Technology i n Environment and human health. Role of the Colleges, Teachers and Students in village adoption towards clean, green and make in villages in various aspects.	Environmental ethics: Role of Indian and other religions and cultures in environmental conservation.

PERCENTAGE OF SYLLABUS REVISED: 45

COURSE FOCUS ON:

☑ Skill Development	☑ Entrepreneurial Development
☑ Employability	☐ Gender Sensitization
☐ Intellectual Property Rights (IPR)	☑ Social Awareness / Environment
☐ Innovations	☑ Constitutional Rights / Human Values / Ethics

Syllabus Revision

Faculty: Biosciences **Board: Microbiology**

Semester: III

Course Code/ Name: 233MB1A3CB /Microbial Genetics

Unit	Existing	Changes
I	**Genetic Material: Properties and Replication** DNA as genetic material: Transformation in Pneumococcus, Transforming principle is DNA and Hershey and Chase Experiment- ~~RNA as a genetic material~~ Structure of DNA and RNA - DNA Replication: Semi conservative by Meselson and Stahl's Experiment, Enzymology and Mechanism of DNA replication.	mRNA, rRNA, tRNA
II	**Gene Expression** Central Dogma - Transcription – ~~Establishment of~~ Genetic Code: ~~Organization of the code, Co-linearity of gene and polypeptide~~ ~~post transcriptional modification~~ - Translation: Initiation, Elongation and Termination.	codon and anti-codon, Wobble hypothesis, post translational modification
III	**Regulation of Gene Expression** Induction - Repression - The operon model: lac (Inducible operon), trp (Repressible operon) - Quorum Sensing –~~Genetic regulation on sporulation in *Bacillus subtilis*~~ Gene regulation in Eucarya and Archaea.	Biofilm formation Ara Operon
IV	**Mutation and Repair** Mutation: Spontaneous and Induced - Effects of Mutations - Types of Mutation: Base substitution, Deletion, Insertion - DNA Repair: Nucleotide Excision repair, Direct Repair, Mismatch repair, Recombination repair, SOS reponse.	Frame shift mutation
V	**Recombination in Bacteria** Transformation - Transposable elements - Bacterial plasmids - Conjugation: F+ and F- Mating, Hfr conjugation and F' conjugation - Transduction: Generalized transduction, Specialized ~~Transduction. Genome mapping of *E.coli*~~	-

PERCENTAGE OF SYLLABUS REVISED: 23

COURSE FOCUS ON:

☑ Skill Development	☑ Entrepreneurial Development
☑ Employability	☐ Gender Sensitization
☐ Intellectual Property Rights (IPR)	☑ Social Awareness / Environment
☐ Innovations	☑ Constitutional Rights / Human Values / Ethics

Syllabus Revision

Faculty: Biosciences **Board:** Microbiology

Semester: III

Course Code/ Name: 233MB1A3CP / CORE PRACTICAL III: MICROBIAL DIVERSITY AND MICROBIAL GENETICS

Exp.	Syllabus
1	Measurement of Microbial cell size by Micrometry using LCD Microscope – Under DBT Star scheme
2	Isolation and observation of algae from water sample by inverted microscope – Under DBT Star scheme
3	Isolation and morphological characterization of fungus from environmental samples – Under DBT Star scheme
4	Isolation of antibiotic producing organisms from soil samples-Crowded plate technique
5	Effect of ultraviolet radiation on the growth of bacteria
6	Isolation and identification of bacteria from skin and oral cavity – Under DBT Star scheme
7	Extraction and quantification of chromosomal DNA from bacteria
8	Estimation of DNA by Nanodrop – Under DBT Star scheme
9	Separation of DNA using agarose gel electrophoresis - Under DBT Star scheme
10	Extraction of plasmid DNA from bacteria
11	Bacterial transformation by Calcium chloride method
12	Isolation of antibiotic resistant bacterial colonies through gradient plate technique

PERCENTAGE OF SYLLABUS REVISED: 100

COURSE FOCUS ON:

☑ Skill Development	☑ Entrepreneurial Development
☑ Employability	☐ Gender Sensitization
☑ Intellectual Property Rights (IPR**)**	☑ Social Awareness / Environment
☑ Innovations	☐ Constitutional Rights / Human Values / Ethics

Syllabus Revision

New Paper

Faculty: Biosciences **Board:** Microbiology

Semester: III

Course Code/ Name: 233MB1ASSA / PEDAGOGY FOR BIOLOGY

Unit	Syllabus
I	**Methods and Techniques of Teaching Biology**: Traditional Methods of Teaching – Lecture, project, field trip and discussion - Demonstration and Experimentation in Teaching Biology – Advantages and disadvantages - Modern Techniques of Teaching Biology – Concept mapping, Constructivism, group discussion and use of analogy.
II	**Resources and Planning for Biology Teaching**: Resources for Teaching Biology- Chalkboard, charts, models and specimens. Textbooks in Teaching Biology: Selection and use - Improvisation in Biology - Teaching Units and Unit Planning - Lesson Preparation and Lesson Plan.
III	**Laboratory Design, Management and Safety**: Laboratory Design – Space, ventilation, sign and labels- Managing the Biology Lab – accidents and first aid record, stock record, damage and breakage record - Safety in the Biology laboratory – Hazard and risk management, safe handling of all chemicals.
IV	**Evaluation in Biology Teaching**: Evaluation of Theory - Evaluating the Cognitive Skills – Essay and objective type questions -Six Categories of Cognitive Behaviour – Knowledge, comprehension, application, analysis, synthesis and evalution.
V	**Professional Development of Biology Teachers**: Professional developmental programmes -Training, seminars and conferences, membership of professional organizations, field visits to laboratories, practices in ICT based on-line platforms.

PERCENTAGE OF SYLLABUS REVISED: 100

COURSE FOCUS ON:

☑ Skill Development	☑ Entrepreneurial Development
☑ Employability	☐ Gender Sensitization
☐ Intellectual Property Rights (IPR)	☐ Social Awareness / Environment
☐ Innovations	☑ Constitutional Rights / Human Values / Ethics

Syllabus Revision

Faculty: Biosciences **Board: Microbiology**

Semester: III

Course Code/ Name: 233MB1ASSB / Bio- Marketing

Unit	Syllabus
I	Scope of bio-entrepreneurship, Introduction to Bio-business, from the Indian context, SWOT analysis of bio-business. Ownership, Development of Entrepreneurship; Stages in entrepreneurial process; Role of entrepreneurs in Economic Development; Entrepreneurship in India; Entrepreneurship - its barriers.
II	Small scale industries: Definition; Characteristics; Need and rationale; Objectives; Scope; Market Feasibility Study; Technical Feasibility Study; Financial Feasibility Study & Social Feasibility Study. Global bio business and industry future trends.
III	Strategy and operation of bisector firms, Business implications and communication of innovations and entrepreneurship in biosectors - lab to market activities, IPR and Challenges in bio-marketing.
IV	Basic contracts and agreements for joint ventures and development, Business plan preparation including strategy and legal requirements, Business feasibility study, financial management, collaborations and partnerships. 4 P's of Marketing – Product, Price, Place and Promotion.
V	Information technology in Biobusiness; Assessment, development and upgradation of technology, Technology transfer, Quality control. Regulatory Compliances and procedures [ISO, GMP], Public private agencies for bio-entrepreneurship (MSME, BIRAC).

PERCENTAGE OF SYLLABUS REVISED: 100

COURSE FOCUS ON:

☑ Skill Development	☑ Entrepreneurial Development
☑ Employability	☐ Gender Sensitization
☑ Intellectual Property Rights (IPR**)**	☑ Social Awareness / Environment
☑ Innovations	☑ Constitutional Rights / Human Values / Ethics

Syllabus Revision

Faculty: Biosciences **Board: Microbiology**

Semester: III

Course Code/ Name: 223MB2ASSA / Good Manufacturing Practices

Unit	Syllabus
I	**Principles and Importance of GMP:** Principles and Importance of GMP – Definition of GMP, Quality management, Personnel, Risk management, Quality control, Documentation, Inspections
II	**Chemical Labelling & Safety:** Chemical Labelling & Safety - Safe handling of chemicals and equipment in the laboratory. Handling and disposal of infected, dangerous materials, accidents, safety measures, fire safety, emergency treatment.
III	**Sanitation:** Sanitation - Cleaning and sanitation compounds and their uses – for process equipments - for environmental cleaning (drains, coolers, etc.) - influence of water quality. Environment sanitation and monitoring - environmental monitoring / pathogen testing - pest control programs.
IV	**Equipment's and SOPs:** Emergency Equipment & Standard Operating Procedures – Maintenance of emergency equipment in a laboratory setting - evaluating Standard Operating Procedures (SOPs) and safety plans
V	**Regulatory Agencies:** International and federal regulatory agencies that impact the work of Microbiology - WHO, FDA, CDC, EPA, FSSAI

PERCENTAGE OF SYLLABUS REVISED: 100

COURSE FOCUS ON:

☑ Skill Development	☑ Entrepreneurial Development
☑ Employability	☐ Gender Sensitization
☐ Intellectual Property Rights (IPR)	☑ Social Awareness / Environment
☐ Innovations	☐ Constitutional Rights / Human Values / Ethics

Syllabus Revision

Faculty: Biosciences **Board: Microbiology**

Semester: III

Course Code/ Name: 233MB2ASSB / Introduction to Human Anatomy

Unit	Syllabus
I	**Parts of the body:** Parts of the body-body cavity, trunk, upper limp, lower limp- membranes-mucos, serus, synovial-basic tissues-epithelial, connective tissue, neuron
II	**Skeletal and Muscular system:** Skeletal system: Classification and functions of skeletal system – structure of bone-joints-clinical aspects. Muscular system: classification and functions-chief muscles of the body.
III	**Respiratory and cardiovascular system:** Respiratory system: Organs of respiration – Nose, Nasopharynx, larynx, trachea, bronchi, lungs – clinical aspects. Cardiovascular system: Heart, circulation of blood, pulse, blood pressure-lymph node, thymus
IV	**Digestive and Urinary system:** Digestive system: Organs of digestive-mouth, tongue, esophagus, stomach-intestine-small intestine, large intestine. Urinary system: components of urinary system-kidney, nephron, ureters, urinary bladder –functions of kidney.
V	**Reproductive and Nervus system:** Reproductive system: Female reproductive system-internal genital organ-external genital organ-male reproductive system – internal and external genital organs. Nervus system: nervus system-neuron, cerebral cortex, cerebellum, cerebrospinal fluid, spinal card.

PERCENTAGE OF SYLLABUS REVISED: 100

COURSE FOCUS ON:

☑ Skill Development	☑ Entrepreneurial Development
☑ Employability	☐ Gender Sensitization
☐ Intellectual Property Rights (IPR)	☐ Social Awareness / Environment
☐ Innovations	☐ Constitutional Rights / Human Values / Ethics

Syllabus Revision

Faculty: Biosciences **Board: Microbiology**
Semester: V
Course Code/ Name: 223MB1A5CA / MEDICAL BACTERIOLOGY

Unit	Existing	Changes
I	Infections - sources of infections:Infections- sources of infections- Types of infections- methods of infections - Definitions- Epidemic, Pandemic, Endemic diseases - Epidemiology of Infectious diseases, Infectious diseases cycle- Investigation of epidemics- control of epidemics. Nosocomial infections.	
II	Medical Importance of Gram positive & ~~negative coccus:~~ Morphology, Pathogenicity and laboratory diagnosis- Gram positive & negative coccus - Staphylococcus aureus, Streptococcus pyogenes, Micrococcus, Enterococcus, Pneumococcus, Neisseria gonorrhea and Neisseria meningitidis, Hemophilus influenza, Helicobacter pylori. Legionella.	Gram positive bacteria
III	Bacterial characteristics of Gram ~~positive~~ organisms: Morphology, Pathogenicity and laboratory diagnosis- Gram positive organismsBacillus anthracis, Corynebacterium diptheriae, Clostridium botulinum, Clostridium tetani, Listeria monocytogenes.	Gram negative bacteria
IV	~~Bacterial characteristics of Gram negative bacillus: Morphology, Pathogenicity and laboratory diagnosis Gram negative Organisms Escherichia coli, Klebsiella, Proteus, Salmonella, Shigella, Pseudomonas, Vibrio cholera.~~	*Leptospira interrogans, Chlamydia trachomatis, Rickettsia prowazekii, Coxiella burnetii.*
V	~~Bacterial characteristics of important pathogens: Morphology, pathogenicity and laboratory diagnosis Mycobacterium tuberculosis, Mycobacterium leprae, Treponema pallidum, Leptospira.~~	**Antimicrobial Resistance** Antimicrobial Resistance – Mechanisms - Factors that favor the spread of antimicrobial resistance – Environment, Drug, Patient, Physician – *Multi Drug Resistance (MRSA) - Control of Antibiotic resistance. Opportunistic pathogen (Acinetobacter baumanii).* Case study At 35 year old women presented with abdominal pain and bloody diarrhea. She experienced fever, chills, nausea and vomiting. A stool culture was sent to the microbiology laboratory. Identify the organism and its importance in causing infection.

PERCENTAGE OF SYLLABUS REVISED: 30

COURSE FOCUS ON:

☑ Skill Development	☑ Entrepreneurial Development
☑ Employability	☐ Gender Sensitization
☑ Intellectual Property Rights (IPR)	☐ Social Awareness / Environment
☑ Innovations	☐ Constitutional Rights / Human Values / Ethics

Syllabus Revision

Faculty: Biosciences **Board: Microbiology**
Semester: V
Course Code/ Name: 223MB1A5CB /VIROLOGY

Unit	Existing	Changes
I	**Morphology and General characteristics** Early development of Virology – Morphology and General characteristics of viruses - Structure of viruses - Virion size, Helical and icosahedra capsid, Nucleic acids, viral envelopes and enzymes - Concept of viroids, virusoids, satellite viruses and prions - Classification and Nomenclature of viruses – Baltimore system of Classification - ~~Cultivation of Viruses~~ - ~~Virus purification and assay.~~	-
II	**Lytic cycle** ds DNA lytic phages - T4 phage, The one step growth, Adsorption, penetration, synthesis, assembly and release of phage particles - ss DNA phage - φX 174, Rolling circle replication.	Coli phages Theta replication
III	**Lysogeny** Temperate bacteriophages, lambda phage, Induction of lysogens, Generation of defective phages and their uses - ~~Reproduction of RNA phages~~.	Screening of lysogenic phages
IV	**Viruses of plants, fungi and algae** Reproduction of ~~animal and~~ plant viruses (TMV, CaMV and BMV) - Viruses of ~~Algae~~, fungi ~~and viruses~~.	Plant virus infection control mechanisms Viruses of algae and fungi
V	**Human viral infections** Pathogenicity and diagnosis - HBV, Mumps, AIDS, Rabies, Influenza, Measles, Rubella, Polio virus, Emerging viral diseases: Ebola, Corona and Chickungunya -Oncogenic viruses (Epstein Barr Virus, Human Papilloma virus) - ~~Concepts of oncogenes and proto oncogenes~~.	Viral vaccines and anti viral drugs

PERCENTAGE OF SYLLABUS REVISED: 21

COURSE FOCUS ON:

☑ Skill Development	☑ Entrepreneurial Development
☑ Employability	☐ Gender Sensitization
☐ Intellectual Property Rights (IPR)	☐ Social Awareness / Environment
☐ Innovations	☐ Constitutional Rights / Human Values / Ethics

Syllabus Revision

Faculty: Biosciences **Board: Microbiolog**
Semester: V
Course Code/ Name: 223MB1A5CC/ MYCOLOGY AND PARASITOLOGY

Unit	Syllabus
I	**General characteristics and classification of fungi:** General properties of fungi – morphology, taxonomy, nomenclature and classification of medically important fungi – virulence factors of fungi causing infection. antifungal susceptibility testing, quality control, preservation and culture collection of fungi.
II	**Cutaneous and Subcutaneous Mycoses:** Superficial cutaneous mycoses-Malasseziosis, Piedra and Dermatophytosis- Tinea pedis, Tinea corporis. Subcutaneous Mycoses-Mycetoma, Sporotrichosis. Allergic fungal disease, mycotoxicoses and mycetismus.
III	**Systemic and Opportunistic mycoses:** Systemic mycoses – Histoplasmosis, Blastomycosis. Opportunistic mycoses – Candidiasis, Aspergillosis and Miscellaneous Mycoses – Oculomycosis, Otomycosis.
IV	**Introduction to Parasites:** Definition, Host, Types of host; Protozoans - Classification and Characteristics; Metazoans - Classification and Characteristics; Mode of Transmission of parasitic infections. Host and Parasites responses.
V	**Parasitic Protists , Platy helminthes and Nematodes:** Study of Morphology, Life Cycle, Prevalence, Epidemiology, Pathogenicity, Diagnosis, Prophylaxis an Treatment of *Giardia intestinalis, Plasmodium vivax.* Platyhelminthes- *Taenia solium*. Nematodes *Ascaris lumbricoides, Ancylostoma duodenale.*

PERCENTAGE OF SYLLABUS REVISED: 100

COURSE FOCUS ON:

☑ Skill Development	☑ Entrepreneurial Development
☑ Employability	☐ Gender Sensitization
☐ Intellectual Property Rights (IPR)	☐ Social Awareness / Environment
☐ Innovations	☐ Constitutional Rights / Human Values / Ethics

Syllabus Revision

Faculty: Biosciences **Board: Microbiology**

Semester: V

Course Code/ Name: 223MB1A5CD / Advanced Diagnostic Microbiology

Unit	Syllabus
I	**Introduction to Molecular diagnostics:** Molecular diagnostics - differences in traditional and molecular diagnostics –Significance of molecular diagnostics – Scope of Molecular diagnostics - Rise of diagnostic industry in Indian and global scenario.
II	**Advanced Diagnosis using Immunoglobins:** Introduction - antigen-antibody binding interactions and assays - monoclonal and polyclonal antibodies. Agglutination - RIA, ELISA's, Western blot- Chemiluminescence, Immunofluorescence.
III	**Blotting and Hybridization Techniques:** Protein and Nucleic acid extraction and analysis (PAGE & AGE); Blotting: Southern (*E.coli*), northern (Herpes virus), Western (HIV) dot blot (*Salmonella typhi*) In-situ hybridization (FISH) (*Pseudomonas* sp.); Nucleic acid probe preparation.
IV	**Amplification and DNA fingerprinting methods:** Nucleic acid amplification methods and types of PCR in disease diagnosis: Reverse Transcriptase-PCR (SARS CoV2), Real-Time PCR (*Mycobacterium tuberculosis*), Mulitplex PCR (Influenza Virus), RAPD DNA fingerprinting (Leptospira sp.)
V	**Genome Sequencing:** Direct Sequencing: Whole Genome Sequencing and Target Sequencing. Sanger Sequencing (*Vibrio* sp.,) New Generation sequencing Method- Illumina (Influenza A), Metagenomics (Respiratory Viruses), Microarray (*Clostridium botulinum*).

PERCENTAGE OF SYLLABUS REVISED: 100

COURSE FOCUS ON:

☑ Skill Development	☑ Entrepreneurial Development
☑ Employability	☐ Gender Sensitization
☐ Intellectual Property Rights (IPR**)**	☐ Social Awareness / Environment
☐ Innovations	☐ Constitutional Rights / Human Values / Ethics

Syllabus Revision

Faculty: Biosciences **Board: Microbiology**

Semester: V

Course Code/ Name: 223MB1A5CP /Medical Microbiology

Exp.	Syllabus
1	Processing of clinical samples: Skin, Urine, Pus, Blood, Sputum and Faeces.
2	Isolation and identification of Bacterial pathogens: *Staphylococcus aureus, Streptococcus* sp., *E. coli, Salmonella, Klebsiella , Pseudomonas, Proteus* sp.,
3	Isolation and identification of clinically important fungi: *Candida* sp., and *Aspergillus* sp.,
4	Cultivation of Virus – Egg Inoculation method (Demonstration).
5	Isolation and titration of Coliphages
6	Tube agglutination – WIDAL
7	Determination of Minimal Inhibitory Concentration – Broth dilution method
8	Cultural characteristics of Aspergillus sp, Penicillium sp and Candida sp
9	LPCB staining for fungal identification.
10	Precipitation – RPR
11	Immunodiffusion – Radial and Ouchterlony's
12	Immunoelectrophoresis – Rocket and Counter current

PERCENTAGE OF SYLLABUS REVISED: 100

COURSE FOCUS ON:

☑ Skill Development	☑ Entrepreneurial Development
☑ Employability	☐ Gender Sensitization
☐ Intellectual Property Rights (IPR**)**	☐ Social Awareness / Environment
☐ Innovations	☐ Constitutional Rights / Human Values / Ethics

Syllabus Revision

Faculty: Biosciences **Board: Microbiology**

Semester: V

Course Code/ Name: 223MB1A5SA /MICROBIAL FERMENTATION

Unit	Syllabus
I	**Fermentation and types:** Fermentation – Major types of organisms used in fermentation. Microbial growth kinetics, Batch culture, Continuous Culture, Fed – Batch – Types, applications, fermentation kinetics - Baffles, Agitator, Impellers and Antifoaming agents).
II	**Types of Fermentor:** Fermentor and types-basic functions of a Fermentor for microbial and animal cell culture – alternative vessel design, common measurements and control systems. Sensors – solutions to common problems in fermentation, anaerobic fermentation. Control of fermentation – requirements for control, design of a fermentation control systems, sensors and controllers, control of incubation, aeration and agitation.
III	**Industrially important strains:** Industrially important strains – Screening methods – Strain development for Improved yield – Mutation, Recombination and protoplast fusion.
IV	**Industrial scale Production:** Production of beverages – beer and wine – vitamin B12 and Riboflavin – Antibiotics – penicillin – production of enzymes – Amylases and Proteases – methods of immobilization.
V	**Downstream process:** Downstream process Biochemistry – Intercellular and extracellular – Centrifugation, filtration, Floatation – solvent extraction, precipitation – Breakage of cells – Physical and Chemical methods.

PERCENTAGE OF SYLLABUS REVISED: 100

COURSE FOCUS ON:

☑ Skill Development	☑ Entrepreneurial Development
☑ Employability	☐ Gender Sensitization
☑ Intellectual Property Rights (IPR)	☑ Social Awareness / Environment
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Syllabus Revision

Faculty: Biosciences **Board: Microbiology**
Semester: V
Course Code/ Name: 223MB1A5DA/ MICROBIAL PRODUCTS AND PROCESS

Unit	Syllabus
I	**Microbial Products**: Single Cell Protein and its Economic Aspects: Bacterial, Actinomycetes, Fungal and Algal Proteins – Brewer's and Baker's yeast – Food and Fodder yeast – Mushroom (Agaricus, Oyster) and Products from Higher fungi (Morchella esculenta,).
II	**Production of Bioethanol & Biofertilizer:** Production, Methods and Uses of Bioethanol (S cerevisiae) – Biodiesel (Chlorella) – Biohydrogen (Chlamydomonas) – Biogas (Methanobacteria). Biofertilizer - Types, Mass production.
III	**Biopolymer production:** Production of Polyhydroxybutyrate (PHB) – Xanthan – Alginate – Cellulose. Adhesive Protein - Rubber - Polyhydroxyalkanoates - Hyaluronic acid.
IV	**Microbial products with pharmaceutical importance:** Vaccines – Preparation of Live (MMR, BCG, Oral Polio), killed (Covaxin, Rabies) vaccine and recombinant vaccine (Covishield)- Toxoid.
V	**Standardization of vaccine:** WHO guidelines in vaccine standards- Quality control- virulence test, environmental risk assessment, interference test, stability test, purity test, safety test, potency test.

PERCENTAGE OF SYLLABUS REVISED: 100

COURSE FOCUS ON:

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Syllabus Revision

Faculty: Biosciences **Board: Microbiology**

Semester: V

Course Code/ Name: 223MB1A5DB/ DAIRY MICROBIOLOGY

Unit	Syllabus
I	**Processing of Milk in dairy industries:** Milk - Introduction, composition, Microorganisms in Milk – Bacteria, Yeasts, Moulds. Starter Cultures – Starter cultures and their biochemical activities. (Streptococcus thermophillus, Lactobacillus bulgaricus) Dairy processing: Pasteurization, UHT treatment, homogenization, Membrane processing, storage and transportation of milk. Judging and grading of milk and its products.
II	**Microbial Products of Milk:** Production of Dairy products: Overview and Fluid Milk Products, Concentrated and Dried Milk Products, condensed milk. Cultured Dairy Products: Whipped Cream, Ice Cream and Cheese. Fermented milk products – Cultured butter milk, Kefir and labneh.
III	**Diseases associated with milk:** Milk borne diseases, antimicrobial systems in milk, sources for contamination of milk – bacterial with examples of infective and toxic types – Clostridium, Salmonella, Shigella, Staphylococcus, Campylobacter, Listeria. Mycotoxins in milk with reference to Aspergillus sp.
IV	**Quality Analysis of Milk:** Sensory analysis of milk – Determination of specific gravity, fat, SNF, TS, acidity and pH in milk and their significance and interpretation – Determination and significance of MBR Test – SPC – Phosphatase activity in milk – common adulterants in milk and their detection techniques – advanced analytical techniques in milk and milk products.
V	**Quality Assurance:** Microbiological quality standards of food. Government regulatory practices and policies. FDA, WHO, EPA and ISI. HACCP – Food safety, safety of dairy products, control of hazards.

PERCENTAGE OF SYLLABUS REVISED: 100

COURSE FOCUS ON:

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☐ Intellectual Property Rights (IPR**)**	☑ Social Awareness / Environment
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Syllabus Revision

Faculty: Biosciences **Board: Microbiology**

Semester: V

Course Code/ Name: 223MB1A5DC / Communicable Disease

Unit	Syllabus
I	**Transmission and control measures of communicable diseases:** Communicable disease – agent – transmission – host factor- environment – communicable disease theory – control principles and methods – vaccination, vector control, treatment and mass drug administration – control strategy and organization –outbreak investigation, survillence, control and eradication – Health regulations – National and international.
II	**Poor hygiene, Food-borne and fecal-oral diseases:** General Characteristics, Mode of Transmission and Control Measures: Poor hygiene Disease – scabies – dermatophytosis – Pinta, Trachoma –Fecal-oral Disease – Cholera, Giardia, – Food-borne Disease – Campylobacter Enteritis, Intestinal fluke.
III	**Soil, Water and Skin diseases:** General Characteristics, Mode of Transmission and Control Measures: Disease of soil contact – Ascaris, Tetanus – Disease of water contact – Buruli Ulcer, Guinea Worm – Skin Infections – Chickenpox, Streptococal Skin infection, Leprosy
IV	**Airborne, Insect borne and Body fluid diseases:** General Characteristics, Mode of Transmission and Control Measures: Airborne infection – Acute Reparatory Infection, Influenza, Whooping Cough – Disease Transmitted through Body Fluids – Gonorrhoea, Marburg Disease – Insect-borne Disease – Malaria, Dengue.
V	**Zoonoses and emerging disease:** General Characteristics, Mode of Transmission and Control Measures: Ectoparasite Zoonoses – Plague, Typhus – Domestic and Synanthropic Zoonoses – Rabies, Brucellosis – New and Emerging Diseases – Arboviruses, Corona.

PERCENTAGE OF SYLLABUS REVISED: 100

COURSE FOCUS ON:

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☐ Innovations	☐ Constitutional Rights / Human Values / Ethics

Syllabus Revision

Faculty: Biosciences **Board: Microbiology**

Semester: V

Course Code/ Name: 223MB1A3GA / Food Sanitation and Public Health

Unit	Syllabus
I	**Food Spoilage:** Food spoilage - Food Preservation – types – High temperature and low temperature and preservatives.
II	**Food Contamination:** Contamination of foods – types of contamination – Physical, Chemical, Biological and Allergen – Source of contamination – Prevention of contamination. Role of personal hygiene in food contamination.
III	**Food borne disease:** Food borne infections - Escherichia coli, Salmonellosis. Food borne intoxications - Botulism. Prevention of food borne diseases.
IV	**Food Sanitation, food laws and regulations:** Sanitation- microorganisms related to food sanitation - Sanitation law (PFA), regulations and guidelines (FSSAI) – Principles of HACCP.
V	**Govt. organization on Public Health:** Government Health Organization in India - ICMR, Ayush, Council for social welfare, Ministry of Health & Family Welfare – Health Services Delivery in India.

PERCENTAGE OF SYLLABUS REVISED: 100

COURSE FOCUS ON:

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Dr. N.G.P. ARTS AND SCIENCE COLLEGE

(An Autonomous Institution, Affiliated to Bharathiar University, Coimbatore)
Approved by Government of Tamil Nadu & Accredited by NAAC with A++ Grade (3rd Cycle - 3.64 CGPA)
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FACULTY OF BIOSCIENCES
DEPARTMENT OF MICROBIOLOGY
BOARD OF STUDIES MEETING

VENUE : INSTRUMENTATION ROOM (B1-1302)
DATE : 05.04.2024
TIME : 10.00 A.M.

ATTENDANCE OF THE 17TH BOARD OF STUDIES MEETING

S. NO.	NAME	POSITION	SIGNATURE
1	Dr. J. Rengaramanujam Professor and Head Department of Microbiology Dr. N.G.P Arts and Science College Coimbatore – 641 048	Chairman	
2	Dr. S. Murugan Associate Professor Karunya University Coimbatore – 641 114	Member (Subject Expert)	
3	Dr. K. Vijila Professor, Department of Agricultural Microbiology TNAU Coimbatore – 641 003	Member (Subject Expert)	ABSENT
4	Dr. Chitra Tangavel Scientist Proteomics Mettupalayam Road Kavundampalayam Coimbatore - 641 043	Member (Industrial Expert)	ABSENT
5	Dr. M. Gnanadesigan Assistant Professor, Department of Microbial Biotechnology Bharathiar University Coimbatore – 641 046	Member (Subject Expert Nominated by Vice Chancellor)	

6	Durgadevi . S Quality Control of Microbiologist Amway India Enterprises Pvt. Lmt, Sipcot Industry Road, Pallapati, Dhindugal - 624201	Alumini	ABSENT
7	Sivaranjani. S (PG)	Student Representatives	Sivaranjani
	Thirisha. Y (UG)		Y. Thirisha.
8	Dr. N. Kuppuchamy Part – I (Four Semester Language)	Co – Opted Member	
9	Dr. Hazel Verbina Part – II (Four Semester Language)	Co – Opted Member	
10	Dr. S. Kokila Allied	Co – Opted Member	5/4/24.
11	Dr. S. Sowrijan Allied	Co – Opted Member	
12	Dr. D. Geetharamani Professor, Dean - Academics	Member	ABSENT
13	Dr. S. S. Sudha Professor, CDC – Coordinator	Member	5/4/24
14	Dr. N. Vidhya Professor	Member	
15	Dr. S. Senthil Prabhu Professor	Member	5/4/24
16	Dr. A. M. Ramachandran Associate Professor	Member	5/4/24
17	Dr. C. Sasikala Associate Professor	Member	5/4/24
18	Dr. S. Karthiksundaram Associate Professor	Member	5/4/2024
19	Dr. R. Mahenthiran Assistant Professor	Member	05/04/24
20	Prof. M. Nivethitha Assistant Professor	Member	M.N 6/4/24
21	Dr. J. Devakumar Assistant Professor	Member	J. D

BoS Chairman/HOD
Department of Microbiology
Dr. N. G. P. Arts and Science College
Coimbatore - 641 048

Academic Council
CHAIRMAN
Dr. N.G.P. Arts and Science College
5/4/24