

M. Phil. Zoology

Programme outcomes of M.Phil (Science)

- Critically analyze issues related to the areas of specialization and develop innovative methodologies to tackle identified issues.
- Acquire knowledge and skills required for teaching in Higher Education Institutions
- Review literature, identify research problems, check the scientific content and develop social competency to work with self-confidence globally.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

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| PSOs | Upon completion students of M. Phil. Zoology will be able to: |
| PSO - 1 | Develop teaching skills and gain confidence in teaching |
| PSO - 2 | Explore and identify components of the environment and assess the importance of biodiversity with recent technologies. |
| PSO - 3 | Identify and analyze interdisciplinary research project. |
| PSO - 4 | Develop competence in writing project proposal. |
| PSO - 5 | Communicate the research findings to the scientific community. |

Semester I

C1: Professional Skills for Teaching – Learning

Sub Code: MPE181

| No. of hours per week | | | Credit | Total no. of hours | Marks |
|-----------------------|----------|----------------|--------|--------------------|-------|
| T | P | Library | 3 + 1 | 75 | 100 |
| 3 | 2 | 2 | | | |

Course Outcomes

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|---------------|--|
| Co No. | Upon completion of this course, scholars will be able to |
| CO-1 | Communicate competently in groups and organisations |
| CO-2 | Construct effective written messages in various formats and styles to a variety of audiences |
| CO-3 | Asses the various theories of learning and their association in the development of learning process in children and adults |

Teaching Plan

Total Contact hours : 75 (Lectures, Assignments, Teaching practice and tests)

| Unit | Module | Topics | Lecture Hours | Learning Outcome | Pedagogy | Assessment/ evaluation |
|----------|--------------------|---|---------------|--|-----------------|------------------------|
| I | Soft Skills | | | | | |
| | 1 | Introduction to soft skills, Soft skills vs Hard Skills, Types of | 1 | Distinguish between soft skills and hard | Brain storming, | |

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|-----------|---|--|---|--|--|-------------------------|
| | | soft skills | | skills | Lecture with PPT | |
| | 2 | Communication skills: Basics in communication, structure of written and oral sentences, verbal, non verbal, body language, interpersonal and intra personal communication | 3 | To communicate competently in groups and organisations | Lecture with PPT, Conversation session, Inquiry based activity , Role play | Formative Assessment I |
| | 3 | Behavioural skills: Leadership skills, time management, Creativity and Lateral Thinking | 3 | To comprehend the leadership skills and to perform effectively as a leader | Lecture ,Group Discussion, Role Play | |
| | 4 | Interview skills: Resume writing, different types of interviews, Etiquettes in interviews, mock interviews | 3 | To apply the principles and techniques in resume writing and in interviews | Lecture, Demonstration, Mock interview | |
| | 5 | Team building and group discussion: progressive stages of team building, parameters of GD | 3 | To apply the procedures of GD in real life situation during formal interviews | Lecture, video clippings, mock group discussion | |
| | 6 | Language skills: Strategies to acquire LSRW skills | 2 | To comprehend listening texts/ speeches by the native speakers. To read effectively with considerable speed and comprehend the texts. To speak and write on simple known topics. | Session in the Language lab for acquiring LSRW skills | |
| II | Techniques and dynamics of teaching-learning | | | | | |
| | 1 | Emerging trends in educational psychology: meaning, scope and methods | 2 | To understand the significance of various methods of educational psychology | Brain storming, Lecture with PPT | Formative Assessment I |
| | 2 | Learning: Theories of learning, Approaches to learning (Classical conditioning –Ivan Pavlov and Operant conditioning- B.F.Skinner), kinds of learning, factors that affect | 5 | To review the various theories of learning and their association in the development of learning process in children and adults | Video clippings, Lecture with PPT | Formative Assessment II |

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| | | learning | | | | |
| | 3 | Motivation: Intrinsic and extrinsic, development of memory and intelligence | 3 | To apply the effect of motivation in the development of memory and intelligence | Lecture with PPT, Video clippings and Lecture | Formative Assessment II |
| III | Incorporating Teaching and learning via Modern Gadgets | | | | | |
| | 1 | MS Word-2007, MS Excel-2007, MS Power point-2007, Concepts in e-resources: making use of web resources | 6 | To develop an understanding of the various e-resources | Lecture, Preparation of documents in word, excel and Power point (Practical session) | Formative Assessment II |
| | 2 | ICT for Research: On-line journals, e-books, courseware, Tutorials, Technical reports, Theses and dissertation | 6 | To acquire skills to use the e-resources in teaching, learning and research work | Lecture, tutorial based on e-content, methods of preparation of dissertation | Formative Assessment II |
| IV | Instructional Technology | | | | | |
| | 1 | Definition, objectives and types of instruction technology, difference between teaching and instruction | 2 | To understand the difference between teaching and instruction | Lecture | Presentations by the learner using creative methods |
| | 2 | Lecture technique: steps, planning and delivery of lecture, lecture with PPT, LCD Projector, AV aids, Smart Class room | 3 | To classify the various methods of lecturing using ICT tools. To apply the various techniques in the class room techniques. | Lecture with PPT and demonstration on how to use LCD projector, Smart class rooms and AV aids (Language lab) | Presentations by the learner using creative methods |
| | 3 | Teaching learning techniques: Team teaching, group discussion, seminar, workshop, symposium and panel discussion | 4 | To differentiate the learning techniques and the strategies to be followed by adopting various methods | Lecture with PPT | Presentations by the learner using creative methods |
| | 4 | Modes of teaching: CAI, CMI and WBI | 2 | To develop the methods of teaching using technology. | Lecture with PPT | Presentations by the learner using |

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| | | | | To apply computer assisted technology for automatic grading. | | creative methods |
| V | Learning, teaching and Evaluation Practice | | | | | |
| | 1 | Teacher assisted class room teaching | 5 | To develop teaching skills | Lecture | Teacher evaluation and suggestions |
| | 2 | Teacher assisted laboratory practice | 3-5 sessions | To improve instructional practices | Demonstration | Teacher evaluation and suggestions |

Name &Signature of the Instructor: Mr.D. Arun, 'Vantage', Nagercoil
Ms. P. Sathya, Dr. Brisca Renuga and Dr. Sheeba Daniel , Dr.Shyla Suganthi-Guest Lecturers

Name &Signature of the coordinator: Dr. Sr. Gerardin Jayam, M.Phil. Coordinator

Semester : I Core 2
Name of the Course : Research Methodology
Course code : MPZ182

| No. of hours per week | | Credit | Total no. of hours | Marks |
|-----------------------|---------|--------|--------------------|-------|
| Contact | Library | 4 | 75 | 100 |
| 5 | 3 | | | |

Learning Objectives

To enable the students to understand the basic concepts of research and its methodologies, identify appropriate research topics, select and define appropriate research problem and parameters, prepare a project proposal (to undertake a project), organize and conduct research (advanced project) in a more appropriate manner, write a research report and thesis and write a research proposal.

Course Outcome

| CO | Upon completion of this course the students will be able to : | PSO addressed | CL |
|--------|---|--------------------|-------|
| CO - 1 | Independently work in a research environment, consolidate the outcome of research and write technical papers. | PSO -1; PSO - 3 | Ap |
| CO - 2 | Gain knowledge on the different techniques and bio-instruments that can be used for the research. | PSO -2 | U |
| CO - 3 | Develop computational skills and apply statistical tools in their research. | PSO -2 | C |
| CO - 4 | Propose a research study, design an experiment and apply appropriate methodologies. | PSO -2 | Ap; E |
| CO - 5 | Prepare a project proposal and apply for grants to funding agencies. | PSO -3 | Ap |
| CO - 6 | Carry out advanced research in specialized areas and transmit their knowledge to the society. | PSO -4 | Ap |

Teaching Plan
Total Hours: 75 (Including Seminar & Test)

| Unit | Module | Description | Hours | Learning outcome | Pedagogy | Assessment |
|------------|--------|--|-------|--|---------------------------|------------------------------------|
| I | 1 | Literature collection: Abstracts, reviews, journals, reference card Literature citation - Name-year system of citation in the text and in references Scope, identification and selection of research problems. Designing experiments | 5 | Identify the research problem and design experiments | Lecture, Group discussion | Formative assessment I, Seminar |
| | 2 | Data collection and analysis. Methods of edition and abstraction Report writing – formatting and typing Preparation of manuscript and proof reading for journals and conferences | 6 | Analyse data and prepare manuscripts | Case study, Review papers | |
| | 3 | Research funding agencies Citation, Calculation of h - index, Scopus index and Impact factor. | 3 | Identify impact factor journals and research funding agencies | Online search | |
| II | 1 | Principles of Microtechniques. Histology: Fixatives and Histological stains – Fixation Tissue processing - Staining. Microtome and Freezing Microtome (Cryostat) | 4 | Prepare tissue sections for histology studies | Lecture, Demonstration | Formative assessment I |
| | 2 | Histochemistry: Histochemical stains - Principles involved in identification of carbohydrates, Proteins, Lipids, Enzymes and Nucleic acids | 2 | Identifies biochemical components in tissues | Lecture, Demonstration | |
| | 3 | Principles and applications of Scanning Electron Microscope (SEM), Transmission Electron Microscope (TEM), STEM Preparations of tissues for SEM and TEM Micrometer and its application | 6 | Explain the principle and applications of microscopes | Lecture, ppt | |
| | 4 | Photomicrography - principles and applications | 2 | Apply the principle of photography in research | Lecture, ppt | |
| III | 1 | Chromatography: Types, Principles and Applications of TLC, Column Ion-exchange, HPLC, GLC and Affinity. | 4 | Explain the principles of chromatography and assess its applications | Lecture, Demonstration | Formative assessment I, Assignment |
| | 2 | Electrophoresis: Types, Principles and Applications of Agarose Gel (AGE), PAGE, SDS-PAGE | 2 | Discuss the principle and applications of electrophoresis | Lecture, Demonstration | |

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| | 3 | Blotting Techniques: Southern and Western Immunological Techniques: Antigen and Antibody preparation and purifications- Immunodiffusion - Immunoelectrophoresis, ELISA. | 5 | Comprehend the importance of blotting and immuno techniques in research | Lecture, Demonstration ,ppt | Formative assessment II |
| | 4 | Tracer techniques: Principles and applications of Autoradiography, Geiger Muller Counter, Scintillation Counter. | 3 | Discuss the applications of radioactive counters | Lecture | |
| IV | 1 | pH determination: pH indicators – pH meter. Principle and operation Buffer solution - preparation – significance. Acid - base titration curve | 3 | Prepare buffer solutions | Demonstration | Formative assessment II |
| | 2 | Centrifugation: Principle, types of centrifugation, centrifuges and uses | 2 | Discuss the application of centrifuges | Lecture,ppt | |
| | 3 | Photometry: Principle, operation and applications of Colorimeter, Spectrophotometer Atomic absorption spectrophotometer, Fourier Transform Infrared spectrometer (FTIR) and Flame photometer | 4 | Apply the principle of photometry | Lecture, demonstration | |
| | 4 | NMR spectroscopy and gas chromatography-mass spectrometry (GCMS) | 2 | Comprehend the importance of NMR and GCMS | Lecture | |
| | 5 | Bioenergetics – principles – estimation of energetic components - Principles and applications of Bomb Calorimeter Oxygen analyzer | 3 | Explain the principle of bioenergetics | Lecture | |
| V | 1 | Statistical methods and applications: Experimental designs – Sampling | 2 | Create appropriate experimental design | Lecture | Formative assessment II |
| | 2 | Probability - Normal curve Test of significance: students “t” test - Chi Square test, F-test, Z-test Analysis of variance (ANOVA) - one way and two way Correlation coefficient- simple linear and multiple correlations. Simple linear regression | 6 | Apply the relevant statistical test in research | Tutorial, problem solving | |
| | 3 | Bioinformatics: Biological databases, sequence comparisons Multiple sequence alignment, profiles, motifs and feature identification Phylogenetic analysis. Bioinformatics in genomes. Bioinformatics software | 6 | Discuss the different bioinformatic tools that can be used in phylogenetic studies | Online analysis | |

Course instructor

Dr. J. Vinoliya Josephine Mary

Head of the Department

Dr. S. Mary Metilda Bai

Semester : I
 Name of the Course : Recent Trends in Zoology
 Course code : MPZ183

Core II

| No. of hours per week | | Credit | Total no. of hours | Marks |
|-----------------------|---------|--------|--------------------|-------|
| Contact | Library | | | |
| 5 | 3 | 4 | 75 | 100 |

Learning Objectives

To provide the students, an understanding on the latest developments and technologies introduced in the field of Biology and to update their knowledge and information especially in Zoology. The student would be able to keep herself abreast with the recent developments.

Course Outcomes

| CO | Upon completion of this course the students will be able to : | PSO addressed | CL |
|--------|---|---------------|-------|
| CO - 1 | Gain knowledge on tissue engineering, transgenic biology and immunotechnology. | PSO - 1 | U |
| CO - 2 | Identify the molecular markers, analyse the methods of sequencing and therapeutic measures. | PSO - 2 | An; E |
| CO - 3 | Classify nanomaterials and discuss biomedical and environmental applications. | PSO - 2 | U; Ap |
| CO - 4 | Apply the knowledge gained from environmental education in ecological research | PSO - 2 | Ap |
| CO - 5 | Describe the significance of stem cell technology and its application in medicine. | PSO - 1 | Ap |
| CO - 6 | Follow ethical principles in handling biological materials. | PSO - 3 | Ap |

Teaching Plan

Total Hours: 75 (Incl. Seminar & Test)

| Unit | Module | Description | Hours | Learning outcome | Pedagogy | Assessment |
|------|--------|---|-------|---|-------------|------------------------------------|
| I | 1 | Biomaterials for tissue engineering. Approaches in tissue engineering - Artificial skin, bone grafts, artificial nerve grafts. | 4 | Appreciate the advances in tissue engineering | Lecture,ppt | Formative assessment I, Assignment |
| | 2 | Transgenic biology: Gene transfer methods, Transgenic plants and animals. | 2 | Apply gene transfer methods in producing transgenic species | Lecture | |
| | 3 | Immunotechnology: Hybridoma – production and applications of monoclonal antibodies | 2 | Prepare monoclonal antibodies | Lecture | |

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| | 4 | Flow cytometry Blotting techniques: Southern, Northern and Western Polymerase chain reaction. | 6 | Apply the blotting techniques and use flow cytometry for studying cell population | Lecture, Demonstrati on | |
| II | 1 | Molecular markers and their applications | 3 | Discuss the applications of molecular markers | Lecture | Formative assessment I, |
| | 2 | Gene therapy – types, approaches and antisense gene therapy. | 4 | Explain the types of gene therapy | Lecture | |
| | 3 | Human genome project, mapping and sequencing. | 3 | Appreciate human genome project | Lecture | |
| | 4 | Genomic research - methods of genome sequencing. Proteomic research - Methods of proteome analysis | 4 | Analyse genomes and proteomes | Lecture, virtual lab through online | |
| III | 1 | Nanotechnology basics- Introduction to nano world- classification of nano materials Application of nano crystals, nano factories, nano biosensors, optical biosensors - DNA sensors, quantum dots. | 5 | Explain the basics of nanotechnology and its applications | Lecture, ppt | Formative assessment I, Seminar |
| | 2 | Biomedical applications: drugs- drug delivery - photodynamic therapy. | 2 | Discuss the biomedical applications of nanodrugs | Lecture, video | Formative assessment II |
| | 3 | Application of nano particles in pollution control, waste water treatment Nano particles as biosensors Risk and threats of nano particles to environment and mankind | 6 | Analyse the risk of nanoparticles | Lecture | |
| IV | 1 | Environmental education, planning and management. Bioremediation. | 3 | Explain the process of bioremediation and need for environmental education | Lecture | Formative assessment II |

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| | 2 | Renewable and non-renewable sources of energy, conventional and non-conventional – solar energy Biogas production Nuclear energy - Indian nuclear power plant. | 6 | Discuss energy sources and its applications | Lecture, group discussion, debate | |
| | 3 | Biodiversity - Types, Measures of diversity - Biodiversity conservation laws. | 3 | Appreciate biodiversity and discuss on measures to conserve them | Field visit | |
| | 4 | Remote sensing and radio telemetry in ecological research. | 2 | Explain the technique of remote sensing and its advantages | Video lecture | |
| V | 1 | Stem cell Biology- embryonic and adult stem cells- reprogramming in stem cell biology | 3 | Differentiate stem cells | Lecture, ppt | Formative assessment II |
| | 2 | Molecular mechanisms of self-renewal - pluripotency, multipotency and lineage differentiation. | 3 | Explain the mechanism of self renewal and differentiation | Lecture | |
| | 3 | Skin stem cells - neural stem cells- cancer stem cells - stem cell gene therapy . Stem cells and diabetes - repair of damaged heart using stem cells. | 4 | Discuss the applications of stem cells | Lecture, ppt | |
| | 4 | Bioethics: need for ethical review - biosafety - ethical implications on transgenic animals- monitoring the welfare of transgenic animals Laboratory animal ethics - ethical guidelines for use of animals in scientific research. Intellectual Property Rights (IPR) and patenting of biological materials. . | 4 | Apply bioethics in research | Lecture | |

Course instructor

Dr. C. Josephine Priyatharshini

Head of the Department

Dr. S. Mary Metilda Bai

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| | 3 | Field sampling techniques, Animal trapping techniques | 1 | Applying different methods to collect animals | Lecture, Demonstration | |
| | 5 | Basic methods in behavioral and food habit studies. Specimen collection and preservation. | 2 | Discuss the food habits and behaviour. Collect Explain different methods of specimen preservation | | |
| II | Population Ecology and Ethology | | | | | |
| | 1 | Population Ecology and Ethology – Introduction. Population: Population growth - growth patterns, growth models- (time lag models). | 2 | Explain population growth patterns and growth models | Lecture | Formative assessment I, |
| | 2 | Life history strategies: r and k selection, Life tables and Survivorship curves. Demography. | 4 | Explain life history strategies | Lecture | |
| | 3 | Behaviour in insects and birds, Social life in ants and termites Foraging and defensive behavior , Nesting behavior, Clutch size and Sex ratio. | 3 | Identify different behaviour of insect and birds. | Lecture and PPT | |
| III | Environmental degradation | | | | | |
| | 1 | Environmental degradation - Introduction .Environmental pollution - Air, Water, Soil, Radioactive and Noise Pollution and their impact | 4 | Identify different pollution and apply remedial measures | Lecture ,ppt | Formative assessment I, Seminar |
| | 2 | Degradation of environment due to Mining, Industries, Agriculture and Urbanization | 2 | Explain effects of different environment | Lecture , video | Formative assessment II |
| | 3 | Global warming, Xenobiotics. Bioremediation: Microbial and phytoremediation. | 3 | Analyse new methods for remediation | Lecture , Project | |
| IV | Toxicology | | | | | |
| | 1 | Toxicity of pollutants, Safety evaluation – acute and chronic toxicity, Bioassays (LC_{50}/LD_{50} determination) | 4 | Analyse and assess the toxicity of pollutants | Lecture , tutorial | Formative assessment II |
| | 3 | Selection of test animals | 1 | Discuss the method of | Discuss | |

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| | | | | selection of animals for research | ion | |
| | 4 | Probit analysis, Dose response – behavioural aspects. Impact of toxicants on organisms: Feeding energetics - hematology – respiration – Excretion | 2 | Apply and calculate the impact of toxicants. | Lecture and demonstration | |
| | | Histological, Biochemical and Molecular changes. | 2 | Can measure the changes in animals body | Demonstration | |
| V | Environmental management and Review of research papers | | | | | Formative assessment II |
| | 1 | Environmental management and Review of research papers – Introduction, Concept of Bioconservation, Sustainable ecodevelopment | 3 | Explain the sustainable bioconservation | Lecture | |
| | 2 | Environmental Impact Assessment (EPA) | 2 | Discuss different assessment methods | Lecture | |
| | 3 | Remote sensing and its applications in Ecology. | 1 | Discuss remotesensing in ecology | | |
| | 4 | Nonconventional sources of energy. | 1 | Differentiate conventional and non conventional resources | Lecture | |
| | 5 | Status and management of endangered animals of India Review of relevant research articles in the field of Environmental studies. | 2 | Apply and analyse the environment management system | Lecture | |

Course instructor

Dr. S. Mary Mettilda Bai

Head of the Department

Dr. S. Mary Mettilda Bai

Semester : I Optional: In-depth study paper (d)

Name of the Course : Applied Immunology and Microbiology

Course code : MPZ187

| No. of hours per week | | Credit | Total no. of hours | Marks |
|-----------------------|----------------|--------|--------------------|-------|
| Contact | Library | 5 | 45 | 100 |
| 3 | 4 | | | |

Learning Objectives

To provide knowledge on recent research in immunology and microbiology and its applications.

Course Outcome

| CO | Upon completion of this course the students will be able to : | PSO addressed | CL |
|--------|---|--------------------|----------|
| CO - 1 | Elucidate the relationship between major cellular and molecular components of the immune system. | PSO - 1 | U |
| CO - 2 | Apply immunological techniques to solve clinical and research problems. | PSO - 2 | Ap |
| CO - 3 | Discuss the microbial diversity and its application in tissue engineering, therapeutics and environment. | PSO -2; PSO - 3 | R; Ap |
| CO - 4 | Apply molecular biological techniques in taxonomy and phylogeny. | PSO - 2 | Ap |
| CO - 5 | Review research articles in the field of applied immunology and microbiology and critically assimilate views on new findings. | PSO - 4 | Ap |

Teaching Plan

Total Hours: 45 (Incl. Seminar & Test)

| Unit | Module | Description | Hours | Learning outcome | Pedagogy | Assessment |
|-----------|--|---|--|---|-----------------------------------|------------------------------------|
| I | Basic concepts and functions of Immune system | | | | | |
| | 1 | Immunity: innate and acquired immunity. Lymphoid organs and cells of the immune system. Antigens - preparation of antigens, types of antigens | 2 | Identify different components of immune system and their function | Lecture, PPT | Formative assessment I, Assignment |
| | 2 | Haptens, super antigens. Clusters of differentiation molecules (CDs) | 2 | Differentiate different immune products | Lecture, PPT | |
| | 3 | Immunoglobulins - structure- types. Genetic diversity of immunoglobulin, Abzymes (catalytic antibodies). | 2 | Describe the structure of immunoglobulins | Lecture, PPT | |
| | | 4 | Immune response: humoral and cell mediated immune response. Immunoematology. Hypersensitivity - (Immediate and delayed type) | 2 | Discuss different immune response | Lecture , PPT |
| | 5 | Vaccines and Immunization schedule. Hybridoma technology and monoclonal antibodies. | 1 | Describe vaccination, immunization and techniques applied in immunology | Lecture , PPT | |
| II | Techniques in immunology | | | | | |

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| | 1 | Antigen-Antibody reactions: agglutination reactions (Widal, Hemagglutination) - tube agglutination reaction, slide agglutination reaction, indirect agglutination inhibition reaction (Human Chorionic Gonadotropin (HCG) detection in urine). | 3 | Appreciates and explain different reactions of antigen antibody | Lecture | Formative assessment I, |
| | 2 | Precipitation reactions: Immuno-diffusion, Immuno-electrophoresis, Immuno-blotting, ELISA, RIA, fluorescence immunosorbent assay, immuno-electronmicroscopy. | 3 | Discuss the methods of detection of antibodies in the body | Lecture | |
| | 3 | Purification techniques: Centrifugation, Electrophoresis, Chromatography. | 3 | Apply simple separation techniques in projects | Lecture and PPT | |
| III | Biodiversity of microbes and application: | | | | | |
| | 1 | Microbial diversity: bacteria, viruses, micro algae, micro fungi & protozoans. | 3 | Identify the groups of microorganism | Lecture, ppt | Formative assessment I, Seminar |
| | 2 | Genetically modified organisms. Microbes in Nanotechnology, applications of microbes in tissue engineering and therapeutic | 3 | Explains the importance of microbes | Lecture, video | Formative assessment II |
| | 3 | Microbial products, biopolymers, biosurfactants, biofertilizers, biopesticides, bioluminescence, carbon sequestration. | 3 | Discuss the importance of Application of microbial products | Lecture, Project | |
| IV | Techniques in Microbiology: | | | | | |
| | 1 | Sterilization – Physical and chemical control of microorganisms. Identification of microorganisms: morphological and biochemical methods. | 3 | Apply microbial techniques for research | Lecture , tutorial | |
| | 2 | Molecular biological techniques: DNA microarrays/chips. DNA | 3 | Discuss different molecular techniques | Discussion | |

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| | | finger printing – RFLP, plasmid profiles, 16S rRNA in taxonomy and phylogeny. | | | | |
| | 3 | Microscopy and its applications - Light Microscopy – bright field, dark field, phase contrast, fluorescent and polarization microscopes, confocal microscope. Susceptibility test for antimicrobial activity - Disc diffusion - well diffusion. Etest. | 3 | Explain the principles and applications of microscope | Lecture and demonstration | |
| V | Tumour Immunology | | | | | |
| | 1 | Tumour Immunology – Diagnosis and therapy. Transplantation immunology. | 2 | Discuss the role of immunological components on tumours | Demonstration | Formative assessment II |
| | 2 | Microbial food spoilage and its control. Antimicrobial agents (anti-bacterial, anti-fungal, anti-viral and anti-protozoan) and their mode of action. | 3 | Apply microbial techniques for research | | |
| | 3 | Review of relevant research articles in the field of applied immunology and microbiology. | | - | - | |

Course instructor
Dr. A. Shyla Suganthi

Head of the Department
Dr. S. Mary Mettilda Bai