



# HANDS-ON RESEARCH

**Biotechnology | Life Science**

**2024**

## Benefits of Joining :

- ✓ **Get Certificate**
- ✓ **100% Hands-On Experience**
- ✓ **Industry Based Training**

## CONTACT DETAILS



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**www.biodeavour.com**



## HANDS ON EXPERIENCE ON TECHNIQUES IN BIOTECHNOLOGY

- Bioinformatics
- Nanotechnology
- Industrial Microbiology
- Industrial Biotechnology
- Veterinary Pharmacology
- Bio-Pharmaceutical Technology
- Herbal Technology
- Medical Microbiology
- Cosmetic Technology
- Marine Biotechnology
- Enzyme Technology
- Molecular Biology

**FEES CONCESSION FOR GROUP  
REGISTRATION**

Our programs are specially designed for the betterment of students career to help them capture knowledge on emerging technologies and to improve skills in Biotechnology.

Our mission to get students industry-ready experience in Biotechnology sector.

### Industry Ready Program

Lack of practical experience is one of the key barriers that freshers face in their quest for a job. Our goal is to prepare students for the workforce in Biotechnology field. Our Internship / Training / Workshops / other research programmes are specifically designed for the career advancement of students to assist them in learning about cutting-edge technologies and enhancing their abilities for Biotechnology and other Life Science research.



### HANDS ON EXPERIENCE ON TECHNIQUES IN BIOTECHNOLOGY

#### Bioinformatics

NGS Variant Calling, Differential Gene Expression Analysis, Metagenomics, Whole Transcriptomics Analysis, Whole Genome Sequence Analysis, Proteomics, In-Silico Vaccine Designing Technology, In-Silico Mutational Analysis, Drug Discovery, Drug Repurposing, Cancer Biology, Subtractive Proteomics, Network Pharmacology, In-Silico Pharmacology, Pharmacophore Modelling, CRISPR rRNA Technology.

#### Industrial Microbiology

Isolation of Industrial Important Bacteria and Fungi, Isolation of Extremophiles, Textile Dye Degradation, Fermentation Technology, Enzyme Production, Bioremediation, Biofuel Production, Biopolymer Production, Waste Water Treatment, Bioprocess Technology, Biosurfactants Production, Secondary Metabolites Production,

#### Industrial Biotechnology

Isolation of Endophytes, Bio-diesel Production, Anti-microbial peptide Production and extraction, in-vitro bio-assays, FAMES Production, Bio-Enzyme Production, Biopesticide Productions and Formulations, Culture Media Optimization by Response Surface Methodology, Feed Formulation, Protein Extraction and Purification,

#### Plant Biotechnology

Phytochemical Analysis, Bioactive Compounds Extraction, Thin Layer Chromatography, Column Chromatography, In-Vitro anti-bacterial activity, In-Vitro anti-fungal activity, In-Vitro anti-oxidant activity, In-Vitro anti-inflammatory activity, In-Vitro anti-Platelets activity, Secondary Metabolites Profiling.



### HANDS ON EXPERIENCE ON TECHNIQUES IN BIOTECHNOLOGY

#### Food Microbiology

Overview of microbial quality control in food, Media preparation and sterilization, Food sampling and processing, Nutritional Analysis, Food Adulteration Test, Water Quality Testings, Microbiological Analysis (Total Plate Count, and Total Coli), Shelf Life Analysis, Hazard Analysis Critical Control Point (HACCP), Interpretation skill development, Reporting & documentation skill development.

#### Herbal Cosmetic Technology

Herbal Extracts Preparation, Herbal Products Development (Herbal Creams, Herbal Lipsticks, Herbal Face Packs, Herbal Joint Spray, Herbal Cough Syrup, and Herbal Pills).

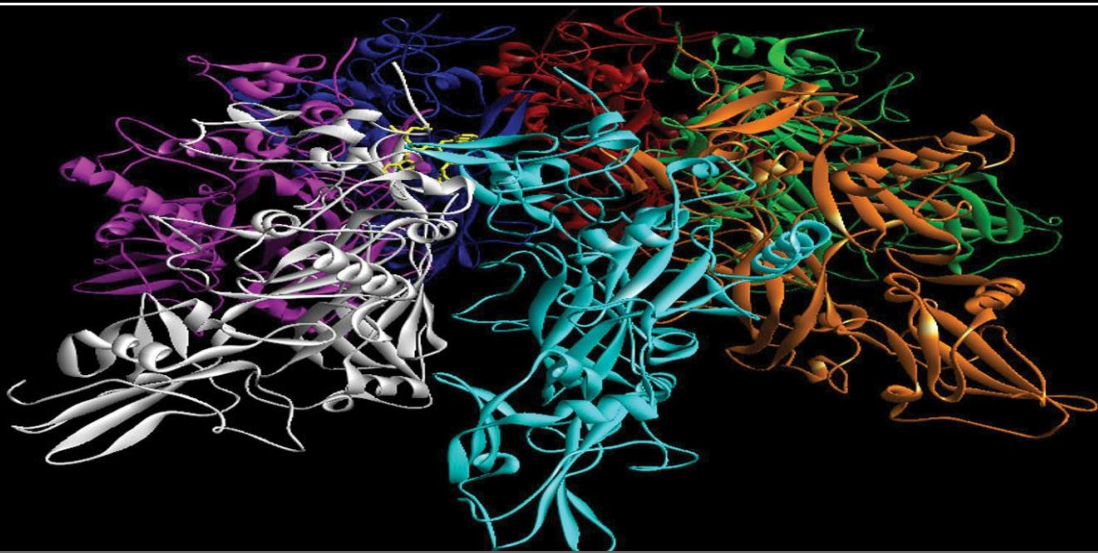
#### Marine Biotechnology

Isolation of Halophiles, Secondary Metabolites Production and Extraction, In-Vitro bio-assays, Isolation of Biopolymers from Seaweeds, Fish Feed Formulation, Antibiotics Discovery.

#### Medical Microbiology

Basics of medical microbiology, GLP, Calculations and Media Preparation, Sterilization Techniques, SOP and Handling of Autoclave, pH meter, Laminar Air Flow, Incubators, Microscope, Plating Techniques, Total Plate Count Method (TPC), Isolation and detection of bacteria from biological samples, Anti-bacterial susceptibility test, Gram staining, Fungal staining (LPCB Staining), Biochemical test.

# Bioinformatics



## MODULE – 1

(2 Weeks)

Starts from Rs. 4500 Per Head

### In-Silico Drug Discovery

- Data Retrieval from Biological Databases
- Protein Modelling
- Protein Secondary Structure Prediction
- Protein Structure Validation
- Protein Structure Energy Minimization
- Ligand Designing by ACD ChemsSketch
- Molecular Docking
- Protein-Ligand Interaction Analysis

## MODULE – 2

(2 Weeks)

Starts from Rs. 6500 Per Head

### Next Generation Sequencing Technology

- Differential Gene Sequencing Data Analysis
- Whole Transcriptomics Sequencing Data Analysis
- Whole Genome Sequencing Data Analysis
- NGS Variant Calling Data Analysis

## MODULE – 3

(2 Weeks)

Starts from Rs. 5000 Per Head

### Microbial Proteomics

- Data Retrieval from Biological Databases
- Identification of Druggable Proteins
- Protein family and fingerprints Prediction
- Anti-microbial Peptide Database Search
- Physio-chemical Properties Prediction
- 3D Modelling
- Structure Validation
- Protein-Peptide Docking
- Visualization of Protein-Peptide Complex

## MODULE – 4

(2 Weeks)

Starts from Rs. 5000 Per Head

### Advanced Proteomics

- Data Retrieval from Biological Databases
- Identification of Unique Proteins from Pathogen
- Identification of Essential Proteins from Pathogen
- Identification of Druggable Proteins
- 3D Modelling
- Structure Validation
- Protein-Ligand Docking by AutoDock
- Visualization of Protein-Ligand Complex

# Bioinformatics



## MODULE – 5

(1 Week)

Starts from Rs. 6000 Per Head

### Whole Genome Sequence Data Analysis

- Data Retrieval from Biological Databases
- Uploading data to galaxy server
- Raw data QC and interpretation
- Reference based alignment
- De novo genome assembly
- Genome finishing
- Genome annotation
- Assembly statistics and genome mapping

## MODULE – 7

(2 Weeks)

Starts from Rs. 5500 Per Head

### In-Silico Vaccine Technology

- Introduction to Reverse Vaccinology
- Antigenic Protein Sequence Retrieval
- Antigenicity and Allergenicity Prediction
- B-Cell and T-Cell Epitopes Prediction
- Vaccine Construction
- Primary and Secondary Prediction
- Vaccine 3D Modelling
- Codon Optimization
- In-Silico Vector Construction
- Molecular Docking
- Molecular Visualization

## MODULE – 6

(2 Weeks)

Starts from Rs. 7500 Per Head

### Next Generation Sequencing Data Analysis

- Differential Gene Sequencing Data Analysis
- Whole Transcriptomics Sequencing Data Analysis
- Whole Genome Sequencing Data Analysis
- NGS Variant Calling Data Analysis

## MODULE – 8

(2 Weeks)

Starts from Rs. 5000 Per Head

### Cancer Genomics

- Data Retrieval from Biological Databases
- Identification of Unique Proteins from Pathogen
- Identification of Essential Proteins from Pathogen
- Identification of Druggable Proteins
- 3D Modelling
- Structure Validation
- Protein-Ligand Docking by AutoDock
- Visualization of Protein-Ligand Complex

# Bioinformatics



## MODULE – 9

(1 week)

Starts from Rs. 5500 Per Head

### In-Silico Gene and Protein Mutational Study

- Data Retrieval from Biological Databases
- Ortholog Analysis
- Protein Stabilizing Centres Prediction
- Variant Effect Prediction
- Evolutionary Conservation Analysis
- Visualization Mutants
- 3D Modelling of Mutant Protein
- Binding Affinity Calculation

## MODULE – 10

(2 Weeks)

Starts from Rs. 5500 Per Head

### In-Silico Pharmacophore Modelling

- Pharmacophore Modelling Basics
- Structure or Ligand based Pharmacophore Modelling
- Ligand Selection by Drug-likeness and ADMET Predictions
- Molecular Docking by AutoDock (Cygwin)
- Inhibition Constant (IC<sub>50</sub>) Calculation
- Molecular Visualization

## MODULE – 11

(2 Weeks)

Starts from Rs. 5500 Per Head

### In-Silico Pharmacology

- Basics of In-Silico Pharmacology
- Drug Target Retrieval
- Network Construction
- Protein-Protein Interaction Analysis
- Gene Ontology Prediction
- Gene Enrichment and Pathway Analysis
- Inhibitor Designing
- Pharmacokinetics Properties Prediction
- Molecular Docking by AutoDock (Cygwin)
- Inhibition Constant (IC<sub>50</sub>) Calculation
- Molecular Visualization

## MODULE – 12

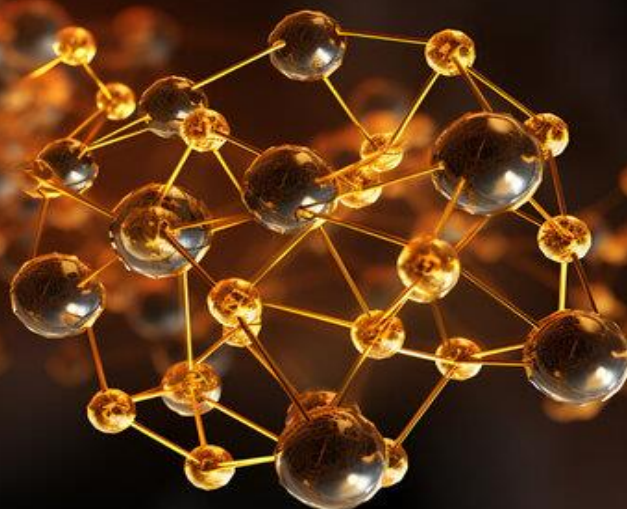
(2 Weeks)

Starts from Rs. 6000 Per Head

### Network Pharmacology

- Basics of Network Pharmacology
- Drug Targets Identification
- Identification of Hub Genes
- Protein-Protein Interaction Analysis
- Gene Ontology Prediction
- Gene Enrichment and Pathway Analysis
- Compound-Target Network Construction
- Molecular Docking by AutoDock (Cygwin)
- Inhibition Constant (IC<sub>50</sub>) Calculation
- Molecular Visualization by Discovery Studio

# Nanotechnology



## MODULE – 1

(1 Week)

Starts from Rs. 5500 Per Head

### Synthesis of Silver Nanoparticles

- Introduction to Nanotechnology
- Overview of different Nanoparticles
- Biosynthesis of Silver Nanoparticles
- Biosynthesis of Copper Nanoparticles
- Anti-bacterial activity of Silver & Copper Nanoparticles
- UV-VIS Analysis of Silver & Copper Nanoparticles
- FT-IR Data Interpretation

## MODULE – 2

(1 Week)

Starts from Rs. 6500 Per Head

### In-Vitro Bio-assays of Nanoparticles

- Anti-bacterial Activity
- Anti-fungal Activity
- Anti-Oxidant Activity by DPPH Method
- Anti-Inflammatory Activity by Protein Denaturation Method

## MODULE – 3

(2 Weeks)

Starts from Rs. 7000 Per Head

### Nanomaterial Synthesis

- Introduction to Nanomaterials
- Synthesis of ZnO nanoparticles
- Synthesis of the ZnO/Polymer nanocomposite material
- Synthesis of the ZnO/Polymer/drug nanocomposite
- Anti-bacterial Activity
- In-Vitro Drug Release Assay

## MODULE – 4

(2 Weeks)

Starts from Rs. 5000 Per Head

### Textile Nanotechnology

- Role of Nanotechnology in Textile Industry
- Reagents Preparation
- Synthesis of Surface Modified Nanoparticles
- Preparation Textile Dye Stock Solution
- UV-VIS Analysis
- FT-IR Data Interpretation
- Dye Degradation Test



# Herbal Technology



## MODULE – 1

(1 Week)

Starts from Rs. 5500 Per Head

### Phytocompounds Extraction

- Basics of Herbal Technology
- Plant Sample Processing
- Crude Extraction Techniques
- Secondary Metabolites Extraction
- Phytochemical Analysis
- Thin Layer Chromatography Profiling

## MODULE – 2

(1 Week)

Starts from Rs. 6500 Per Head

### In-Vitro Bio-assays of Phytocompounds

- Phytocompounds Extract Preparation
- Reagents and Stock Solution Preparations
- Anti-bacterial Activity
- Anti-fungal Activity
- Anti-oxidant Activity by DPPH Method
- Anti-Inflammatory Activity by Protein Denaturation Method

## MODULE – 3

(1 Week)

Starts from Rs. 5500 Per Head

### Nanomaterial Synthesis

- Plant Sample Processing
- Reagents and Stock Solution Preparations
- Phytocompounds Extraction by Soxhlet Extraction Method
- Anti-Oxidant activity by DPPH Method

## MODULE – 4

(2 Weeks)

Starts from Rs. 7000 Per Head

### Bio-active Compounds Extraction

- Plant Sample Processing
- Reagents and Stock Solution Preparations
- Crude Extraction Techniques
- Secondary Metabolites Extraction
- Thin Layer Chromatography Profiling
- UV-VIS Analysis
- Anti-bacterial activity of Crude Extract
- Minimum Inhibitory Concentration (MIC) Test

# Marine Biotechnology



## MODULE – 1

(1 Week)

Starts from Rs. 5500 Per Head

### Marine Endophytes Isolation & Culturing Technique

- Introduction to marine biotechnology
- Reagents and Stock Solution Preparations
- Marine sample collection
- Surface Sterilization Technique
- Isolation of endophytic bacteria from Marine Samples
- Streak Plate Technique
- Morphological analysis by staining method

## MODULE – 2

(2 Weeks)

Starts from Rs. 6500 Per Head

### Bioluminescent Bacteria Culturing Technique

- Introduction to Bioluminescent bacteria
- Reagents and Stock Solution Preparations
- Marine sample collection
- Isolation of Bioluminescent bacteria from Marine Samples
- Streak Plate Technique
- Broth Culturing Technique
- Morphological analysis by staining method

## MODULE – 3

(2 Weeks)

Starts from Rs. 7000 Per Head

### Exopolysaccharide (EPS) production by Marine Bacteria

- Introduction to marine biotechnology
- Reagents and Stock Solution Preparations
- Marine sample collection
- Isolation and screening of EPS-producing bacteria
- Total Sugar Determination
- Streak Plate Technique
- Morphological analysis by staining method

## MODULE – 4

(2 Weeks)

Starts from Rs. 7000 Per Head

### Marine Antimicrobial Peptides Extraction

- Reagents and Stock Solution Preparations
- Spread Plate & Streak Plate Techniques
- Probiotic Bacteria isolation
- Morphological analysis by staining method
- Anti-microbial peptides extraction
- Partial Purification of Anti-microbial peptides
- Anti-bacterial activity of Multi Drug Resistant *Staphylococcus aureus*

# Industrial Biotechnology



## MODULE – 1

(2 Weeks)

Starts from Rs. 6500 Per Head

### Bio-diesel Production

- Introduction to marine biotechnology
- Reagents and Stock Solution Preparations
- Marine sample collection
- Surface Sterilization Technique
- Isolation of endophytic bacteria from Marine Samples
- Streak Plate Technique
- Morphological analysis by staining method
- FAMES Production
- Flame test

## MODULE – 3

(2 Weeks)

Starts from Rs. 7000 Per Head

### Production Media Optimization

- Screen microbial strains for fermentation potential.
- Isolate strains with high fermentation productivity.
- Identify key factors influencing fermentation efficiency.
- Optimize fermentation conditions based on critical parameters.
- Characterize and validate the performance of the optimized process at lab scale.

## MODULE – 2

(2 Weeks)

Starts from Rs. 6500 Per Head

### Industrial Important Enzyme Production

- Introduction to Bioluminescent bacteria
- Reagents and Stock Solution Preparations
- Marine sample collection
- Isolation of Bioluminescent bacteria from Marine Samples
- Streak Plate Technique
- Broth Culturing Technique
- Morphological analysis by staining method

## MODULE – 4

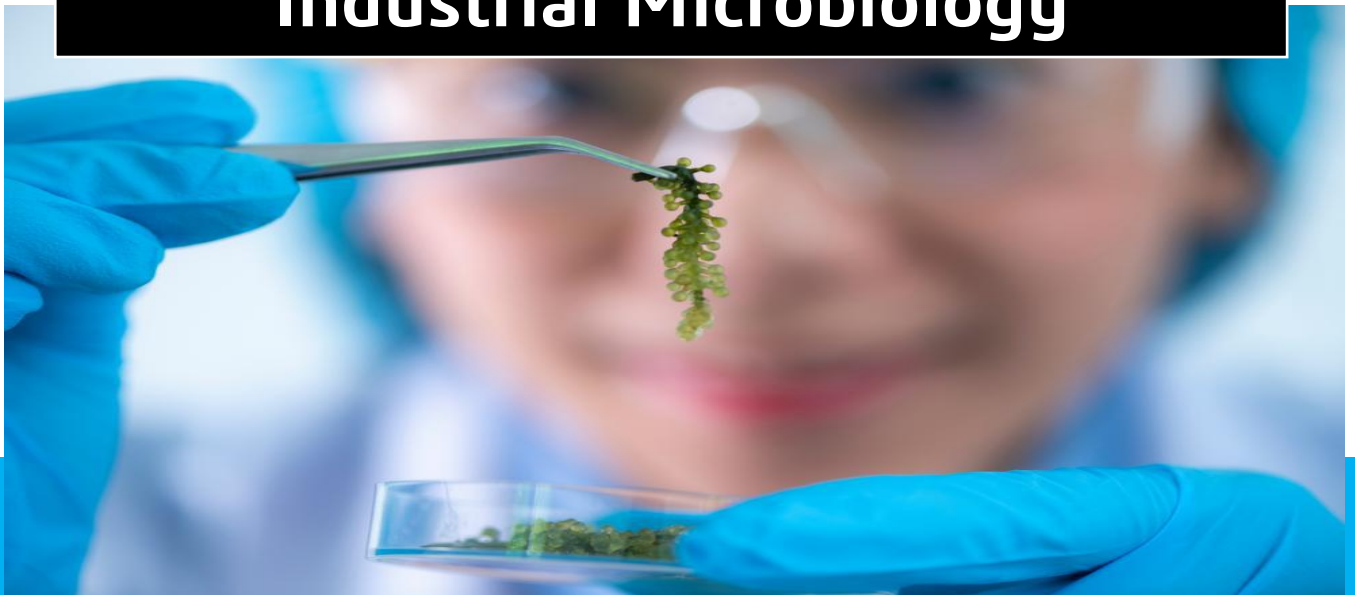
(2 Weeks)

Starts from Rs. 7000 Per Head

### Biopolymer Production

- Screen microbial strains for biopolymer production potential.
- Isolate strains suitable for efficient biopolymer synthesis.
- Characterize and identify the biopolymer production potential of selected strains.
- Optimize conditions for increased biopolymer yield and quality.
- Evaluate the suitability of the produced biopolymers for specific applications.

# Industrial Microbiology



## MODULE – 1

(2 Weeks)

Starts from Rs. 7000 Per Head

### Microbial Enzyme Extraction & Partial Purification

- Introduction to microbial enzymes
- Reagents and Stock Solution Preparations
- Types of enzymes, Good laboratory practices (GLP), Instrument handling
- Concept of basic calculation (Percentage, molarity and normality)
- Broth culturing technique
- Extraction of Microbial Enzyme
- Partial Purification of Microbial Enzyme
- Dialysis of Microbial Enzyme

## MODULE – 3

(2 Weeks)

Starts from Rs. 7000 Per Head

### Probiotic Development

- Screen microbial strains for probiotic properties.
- Isolate strains with desirable probiotic property.
- Characterize and identify the selected probiotic strains.
- Optimize conditions for enhanced probiotic viability.
- Evaluate the efficacy of the selected probiotic strains in laboratory studies.

## MODULE – 2

(2 Weeks)

Starts from Rs. 6500 Per Head

### Fermentation Technology

- Introduction to Bioluminescent bacteria
- Reagents and Stock Solution Preparations
- Marine sample collection
- Isolation of Bioluminescent bacteria from Marine Samples
- Streak Plate Technique
- Broth Culturing Technique
- Morphological analysis by staining method

## MODULE – 4

(2 Weeks)

Starts from Rs. 6500 Per Head

### Microbial Bioremediation

- Screen microbial strains for pollutant degradation capability.
- Isolate strains with high pollutant degradation efficiency.
- Identify and characterize the mechanisms of pollutant degradation.
- Optimize conditions for enhanced bioremediation efficiency.

# Agricultural Biotechnology



## MODULE – 1

(2 Weeks)

Starts from Rs. 6500 Per Head

### Isolation and Culturing of Endophytic Fungi

- Introduction to endophytic fungi role in plant growth promotion
- Reagents and Stock Solution Preparations
- Marine sample collection
- Surface Sterilization Technique
- Isolation of endophytic fungi from Marine Samples
- Streak Plate Technique
- Morphological analysis by staining method
- Inoculation of endophyte and growth promotion study

## MODULE – 3

(2 Weeks)

Starts from Rs. 6500 Per Head

### Anti-fungal Spray Formulation

- Introduction to Plant fungal disease
- Reagents and Stock Solution Preparations
- Synthesis of Microemulsion
- In-Vitro Encapsulation efficiency test
- UV-VIS Analysis of Microemulsion
- In-Vitro Anti-fungal activity
- In-Vivo Anti-fungal activity

## MODULE – 2

(2 Weeks)

Starts from Rs. 6500 Per Head

### Biofertilizer Formulation

- Introduction to Biofertilizer
- Reagents and Stock Solution Preparations
- Marine sample collection
- Isolation of soil bacteria
- Determination of Growth Curve
- Media Preparation for bio-fertilizer production
- Biofertilizer Formulation
- Effectiveness of Biofertilizer

## MODULE – 4

(2 Weeks)

Starts from Rs. 5000 Per Head

### Formulation of Bio-pesticides

- Isolation of biopesticide producing soil bacteria
- Extraction of biopesticide from natural sources
- Reagents and Stock Solution Preparations
- Streak Plate Technique
- Morphological analysis by staining method
- Inoculation of bacteria and growth promotion study

# Herbal Cosmetic Technology



## MODULE – 1

(2 Weeks)

Starts from Rs. 5500 Per Head

### Herbal Soaps and Shampoo Formulation

- Introduction to herbal soaps and shampoos
- Regulation of Herbal Cosmetics
- Extraction of Bioactive Crude Extracts
- Herbal Soap Formulation
- Herbal Shampoo Formulation
- Wash performance of Herbal Soap and Shampoo
- Organoleptic Test
- Foam height and stability Test
- pH Test
- Anti-microbial Test

## MODULE – 2

(1 Week)

Starts from Rs. 5000 Per Head

### Herbal Creams and Lipsticks

- Introduction to Herbal Creams and Lipsticks
- Selection of Ingredients
- Herbal Cream Formulation (Non-greasy)
- Herbal Non-Transfer Lipstick
- pH Test
- Melting Point Test
- Aging Stability Test
- Surface anomalies
- Perfume Stability Test



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