SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS)
(Affiliated to Bharathidasan University, Tiruchirappalli)
(Accredited by NAAC)
SUNDARAKKOTTAI- 614016, MANNARGUDI,

PG AND RESEARCH DEPARMENT OF MICROBIOLOGY IN COLLABORATION WITN BIOMININ LABORATORIES ORGANIZES

FIVE DAY FREE SUMMER TRAINING PROGRAMME ON

"BIOINSTRUMENTATION" – 25.05.2026 to 30.05.2026

REPORT OF THE PROGRAMME

Introduction

The PG and Research Department of Microbiology, Sengamala Thayaar Educational Trust Women's College, in collaboration with Biominin Laboratories, successfully organized a Five-Day Free Summer Training Programme on Bioinstrumentation from 25th May 2026 to 30th May 2026. The programme was designed to provide students, research scholars and aspiring life science professionals with practical exposure to fundamental microbiological, molecular, analytical, immunological, and quality control techniques widely employed in research laboratories, diagnostic centres and industrial sectors.

The programme integrated theoretical sessions with extensive hands-on training, enabling participants to acquire practical skills in handling laboratory instruments and performing various microbiological and molecular biological procedures. The training served as a platform for skill development, research orientation, and entrepreneurship awareness.

Objectives of the Programme

1. To familiarize participants with fundamental and advanced bioinstrumentation techniques.
2. To provide hands-on training in microbiological, molecular, analytical, and immunological techniques.
3. To develop technical competencies required for research and industrial applications.
4. To enhance practical knowledge in laboratory diagnostics and quality control.
5. To promote scientific thinking and research aptitude among students.
6. To create awareness about laboratory safety, quality assurance, and standard operating procedures.
7. To introduce participants to bioentrepreneurship opportunities in the life science sector.
8. To bridge the gap between academic learning and practical laboratory applications.

Day-Wise Report

Day I – Fundamental Techniques in Microbiology

Date: 25.05.2026

The programme commenced with an inaugural session followed by training on fundamental microbiological techniques. Participants were introduced to essential laboratory practices and microscopic techniques that form the foundation of microbiological research.

Topics Covered

- Sterilization methods and equipment
- Pure culture techniques
- Micrometric calibration (Micrometry)
- Staining techniques
- Microscopic techniques
- Multifocus microscopy
- Tissue culture
- Projection microscope
- Camera lucida

Hands-on Training

- Operation of autoclave and sterilization equipment
- Isolation and maintenance of pure cultures
- Calibration of ocular and stage micrometers
- Preparation and staining of microbial specimens
- Observation using different microscopic techniques
- Demonstration of tissue culture and projection microscopy

Learning Outcome

Participants acquired practical knowledge of basic microbiological techniques, microscopic observations, microbial staining methods, and calibration procedures essential for laboratory investigations.

Day II – Molecular Techniques

Date: 26.05.2026

The second day focused on molecular biology techniques used in genetic and microbiological research.

Topics Covered

- Polymerase Chain Reaction (PCR)
- Isolation of Plasmid DNA
- Isolation of Genomic DNA

Hands-on Training

- Extraction of plasmid DNA
- Isolation of genomic DNA from biological samples
- Preparation of PCR reaction mixtures
- Operation and programming of PCR equipment
- Amplification of DNA samples

Learning Outcome

Participants developed practical skills in DNA isolation and PCR techniques and gained an understanding of molecular diagnostics and genetic analysis.

Day III – Analytical and Immunological Techniques
Date: 27.05.2026

The third day introduced participants to advanced analytical instruments and immunological diagnostic techniques used in research and clinical laboratories.

Topics Covered

- High Performance Liquid Chromatography (HPLC)
- Gas Chromatography (GC)
- Atomic Absorption Spectroscopy (AAS)
- Double Immunodiffusion
- Hematology Techniques
- Blood Grouping
- Rh Typing
- Total Blood Count (WBC and RBC)
- ASO Test
- RPR Test
- WIDAL Test

Hands-on Training

- Demonstration of HPLC and GC instrumentation
- Sample preparation and chromatographic analysis
- Operation and applications of AAS
- Performance of double immunodiffusion technique
- Blood grouping and Rh typing procedures
- Enumeration of WBC and RBC using hemocytometer
- Demonstration of ASO, RPR, and WIDAL tests

Learning Outcome

Participants gained exposure to sophisticated analytical instruments and diagnostic techniques used in biomedical research, clinical laboratories, and industrial quality control.

Day IV – Microbiological Quality Control
Date: 29.05.2026

The fourth day focused on quality control procedures and microbiological analysis of environmental and food samples.

Topics Covered

- Water Quality Analysis
- Milk Quality Analysis
- Food Quality Analysis
- Air Quality Testing

Hands-on Training

- Collection and processing of environmental samples
- Microbiological examination of water samples
- Quality assessment of milk and food products
- Air sampling and microbial load determination
- Interpretation of microbiological quality standards

Learning Outcome

Participants developed competency in microbiological quality assessment and learned techniques used in environmental monitoring and food safety evaluation.

Day V – Bioentrepreneurship Ideas for Start-Ups
Date: 30.05.2026

The final day focused on entrepreneurship opportunities in microbiology and biotechnology. Participants were introduced to small-scale business models and value-added biological products.

Topics Covered

- Vermicompost Production
- Preparation of Micronutrients
- Edible Mushroom Cultivation
- Preparation of Herbal Soap
- Herbal Cosmetics Production
- Traditional Organic Fertilizer Production

Hands-on Training

- Preparation of vermicompost units
- Formulation of micronutrient mixtures
- Demonstration of mushroom cultivation techniques
- Preparation of herbal soap
- Formulation of herbal cosmetic products
- Preparation of organic fertilizers

Learning Outcome

Participants gained entrepreneurial knowledge and practical exposure to sustainable bio-based enterprises, encouraging self-employment and start-up initiatives.

Valedictory Function

The programme concluded with a valedictory function and certificate distribution ceremony. Participants shared their learning experiences and expressed appreciation for the practical exposure provided throughout the programme. Faculty members highlighted the importance of integrating theoretical knowledge with practical skills and encouraged students to pursue research and entrepreneurial ventures in life sciences. Certificates were distributed to all participants in recognition of their successful completion of the training programme.

Overall Outcomes of the Programme

The programme successfully achieved its objectives and enabled participants to:

- Acquire hands-on experience in microbiological, molecular, analytical, and immunological techniques.
- Develop practical laboratory skills and technical competence.
- Understand the applications of advanced bioinstrumentation in research and diagnostics.
- Gain exposure to quality control procedures in water, food, milk, and air analysis.
- Enhance problem-solving and analytical skills.
- Improve awareness of laboratory safety and quality assurance practices.
- Develop research aptitude and scientific temperament.
- Explore entrepreneurship opportunities in microbiology and biotechnology.
- Strengthen employability and career readiness in life science disciplines.

Conclusion

The Five-Day Free Summer Training Programme on Bioinstrumentation organized by the PG and Research Department of Microbiology, Sengamala Thayaar Educational Trust Women's College, in collaboration with Biominin Laboratories, was highly successful. The programme provided comprehensive training in microbiological, molecular, analytical, immunological, and quality control techniques while also introducing participants to bioentrepreneurship opportunities. The combination of expert guidance, practical exposure, and interactive learning significantly enhanced the knowledge and skills of the participants, contributing to their academic, research, and professional development.

Acknowledgement

The PG and Research Department of Microbiology, Sengamala Thayaar Educational Trust Women's College, expresses its heartfelt gratitude to our Honourable Correspondent, **Dr. V. Dhivaharan**, for his generous financial support and constant encouragement in organizing the Five-Day Free Summer Training Programme on Bioinstrumentation – 2026.

We sincerely acknowledge his visionary leadership and unwavering commitment to promoting quality education, scientific learning, and skill development among students. His valuable financial assistance enabled the successful conduct of the programme and provided participants with an excellent platform for gaining practical exposure to advanced microbiological and bioinstrumentation techniques.

We are especially grateful for his thoughtful arrangements for **food and accommodation**, which ensured the comfort and well-being of all participants throughout the training programme. His generous support created a conducive learning environment and contributed significantly to the overall success of the event. We also extend our sincere thanks to the Principal, faculty members, organizing committee members, and student volunteers for their dedicated efforts and cooperation. Their contributions played a vital role in the smooth execution of the programme. Finally, we thank all the participants for their enthusiastic involvement and active participation, which made this training programme a meaningful and memorable learning experience.

Once again, we place on record our profound appreciation to Dr. V. Dhivaharan for his invaluable support, guidance, and commitment to academic excellence and student empowerment.