Avinashilingam Institute for Home Science and Higher Education for Women

Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore was established as an aided college by the great patriot and educationist Padma Bhushan Dr. T. S. Avinashilingam under the auspices of the Avinashilingam Education Trust in 1957. Dr. Rajammal P. Devadas, doyen of Home Science nurtured the institution to what it is today. It is now one of the largest institutions in the country to impart quality education to women at all levels.

Department of Biochemistry, Biotechnology & Bioinformatics

The Department of Biochemistry, Biotechnology & Bioinformatics is very well equipped with very good UG, PG and research laboratories that house state-of-the-art equipment. The department also has the Advanced Research Laboratory - a centralized facility and specialized Animal Tissue Culture, Plant Tissue Culture, Enzymology, Immunology and Bioinformatics laboratories where high quality research activities are being carried out. The students also get practical exposure in operating sophisticated instruments. Manpower is available to carry out Consultancy, Collaborative projects, Outsourcing and Training programmes

Facilities available in the department

Trinocular Phase Contrast Microscope with imaging software, Real Time PCR, Automated Hematology Analyzer, Fermenter, Phase Contrast Flourescent Microscope, Flow cytometer, High Performance Liquid Chromatography, Two Dimensional Gel Electrophoresis, Nanospectrophotometer, Bone densitometer, Cold Room, High Performance Thin Layer Chromatography, Protein Concentrator, Protein Chemiluminescence

Scope of the Internship

Students of biological sciences need to develop an in-depth knowledge in basic sciences along with the requisite skill sets to build their career on a strong foundation. To this end, exposure to basic and advanced laboratory techniques will provide an edge to face interviews, judge the suitability of job opportunities and choose their career options wisely. Curriculum of most programmes demand that students undergo at least one training in research institutions/industries to get research/industry exposure. This training will provide students with a bird's eye view of the various aspects of biological science research and applications.

Last Date for Application: 31.5.2022

Date of Internship: June 2022

Modules

Module No.	Domain	Fee Structure (Rs)
1	Basic Microbiology & Basic Bioinformatics	1000
2	Basics of Tissue Culture	1000
3	Diagnostic and Clinical Biochemistry	1000
4	Advanced Microbiology & Advanced Bioinformatics	2000
5	Advanced Research Techniques	2000
6	Tissue Culture Techniques	2000
7	Enzymology & Immunology	2000
8	Molecular Biology & rDNA Technology	2000

Module 1

Basic Microbiology

Pure culture techniques, Identification of bacteria by staining techniques, Biochemical tests for identification of microbes, Production of primary & secondary metabolites, Antimicrobial susceptibility testing

Basic Bioinformatics

Accessing biological databases for retrieving protein and nucleotide sequences, Database search using BLAST and FASTA, Multiple sequence alignment and phylogenetic analysis using MEGA software, Molecular visualization using Deep view and RASMoL

Module 2

Basics of Tissue Culture

Plant Tissue Culture

Laboratory practices, Requirements and Safety, Handling and Instrumentation of Plant Tissue Culture, Preparation of Stock solutions and MS medium, Demonstration of Surface sterilization of explants and *in vitro* seed germination, Demonstration of effect of plant hormones on *in vitro* plant regeneration, Demonstration of preparation of explants for callus induction, Demonstration of Somatic Embryogenesis Encapsulation, Phytochemical analysis

Animal Tissue Culture

Basics in animal tissue culture – Sterilization Techniques, Media preparation, Primary cell culture, Viability testing

Module 3

Diagnostic and Clinical Biochemistry

Blood grouping, RBC and WBC Count, PCV, ESR, Platelet Count (Hematology Analyser), Glucose Tolerance Test, Glycosylated Haemoglobin, Serum Amylase and Lipase, Cholesterol, LDH, Troponin

Module 4

Advanced Microbiology

Microscopy of different organisms, Assessment of microbial dynamics of soil, Microbiological analysis of food products, Analysis of bacterial contamination of water, Fermentation techniques

Advanced Bioinformatics

Small molecule database – PubChem and ZINC database, Acquisition of protein target structure – PDB databank, Understanding the file formats (sdf, mol, pdb), LINE Notations of small molecules (SMILES), Comparative/Homology modeling, Validation of predicted protein structure, Active site prediction or pocket identification, Molecular docking, Prediction of ADME profile

Module 5

Advanced Research Techniques

Preparation of extracts and yield calculation, Recording absorption spectrum, Quantification of nucleic acids, Estimation of chromogenic derivatives of biological molecules in microvolumes, Separation of plant pigments (TLC), Separation of amino acids by column chromatography, Gel electrophoresis (PAGE), ELISA, Basic statistical analysis of data, Demonstration: HPLC, HPTLC and Flow Cytometry

Module 6

Tissue Culture Techniques

Plant Tissue Culture

Laboratory practices, Requirements and Safety, Handling and Instrumentation of Plant Tissue Culture, Preparation of Stock solutions and MS medium, Surface sterilization of explants and *in vitro* seed germination, Hands on training on *in vitro* plant regeneration, Preparation of explants for callus induction, Somatic Embryogenesis and Artificial Seed synthesis, Phytochemical analysis

Animal Tissue Culture

Basics in animal tissue culture – Sterilization Techniques, Media preparation, Primary cell culture, Viability testing, Secondary cell culture, Apoptosis detection assays (Staining), Cytotoxicity test, Fumigation, Cryopreservation

Module 7

Enzymology

Isolation and purification of enzymes by Ammonium Sulphate precipitation, Dialysis, Column chromatography, SDS PAGE/Native PAGE, Immobilization of enzymes

Immunology

Antigen-Antibody reactions: Haemagglutination, Precipitin ring test, Immunodiffusion – single and double, Lymphocyte isolation, Immunoelectrophoresis - Rocket, Countercurrent, ELISA

Module 8

Molecular Biology & recombinant DNA Technology

Isolation and purification of genomic DNA from plant source/E coli DH5α strain, Agarose gel electrophoresis of isolated plant DNA, RNA isolation from Fusarium/Bacteria/Yeast, Restriction digestion and ligation, Effect of UV radiation on bacterial growth, PCR, Slot lysis, Competent cell preparation and transformation

Payment to be made through online transfer to

The Registrar

Bank Name: INDIAN BANK

Branch: Avinashilingam Deemed University Campus

IFSC code: IDIB000A005

Account No.:6010310202

Who can apply

Students currently pursuing or completed undergraduate and post graduate programmes in Life Science disciplines can apply.

Details required for applying

- Identity proof showing programme studied/studying (College Identity Card/Transfer Certificate/Provisional/Degree Certificate)
- Passport size photograph (30 Kb)
- Registration fee payment details

How to apply?

Applications can be filled through the link:
https://forms.gle/SWBbZq6WQH6S8qTQ9

Domain	Co-ordinators
Basic Microbiology & Basic Bioinformatics	**Dr. D .Kavitha & Dr. M. Rajeswari**
Basics of Tissue Culture	**Dr. E. Nithya & Dr. M. Sudha Devi**
Diagnostic and Clinical Biochemistry	**Dr. S. Velvizhi & Dr. C.C.S. Vasundhara**
Advanced Microbiology & Advanced Bioinformatics	**Dr T. Angayarkanni & Dr. N. Santhi**
Advanced Research Techniques	**Dr. R. Nirmaladevi & Dr. A. Poornima**
Tissue Culture Techniques	**Dr. Kalaiselvi Senthil & Dr. S. Sumathi**
Enzymology & Immunology	**Dr. A. Shobana & Dr. K. V. Shalini**
Molecular Biology & rDNA Technology	**Dr. S. Gayathri Devi & Dr. S. T. Yamuna**

Organizing Committee

Chief Patrons

Dr. T. S. K. Meenakshisundaram
Managing Trustee, The Avinashilingam Education Trust

Dr. S. P. Thyagarajan
Chancellor, Avinashilingam Institute for Home Science and Higher Education for Women

Patrons

Dr. Bharathi Harishankar
Vice Chancellor, Avinashilingam Institute for Home Science and Higher Education for Women.

Dr. S. Kowsalya
Registrar, Avinashilingam Institute for Home Science and Higher Education for Women

Convenor

Dr. A. Vijayalakshmi
Dean, School of Biosciences

Co-ordinators

Dr. Anitha Subash, Professor & Head,
Dr. S. Gayathri Devi, Professor
Department of Biochemistry, Biotechnology & Bioinformatics

Organizing Secretary

Dr. E. Nithya, Assistant Professor
Ph: 9842271110; e-mail: nithya_bc@avinuty.ac.in

Avinashilingam Institute for Home Science and Higher Education for Women

(Deemed to be University Under category 'A' by MHRD)
(Estd. u/s3 of UGC Act 1956)
Re-Accredited with 'A++' Grade by NAAC, Recognized by UGC under Section 12B Coimbatore–641043,Tamil Nadu, India

Department of Biochemistry, Biotechnology & Bioinformatics

Summer Internship on

Recent Techniques in Biological Sciences

June 2022