

**Hislop School of Biotechnology,  
Hislop College  
Research & Bioanalytical Services in Biotechnology/Life Sciences**

- **Certificate Courses**
  - **Bioinformatics**
  - **Plant Tissue Culture**
  
- **Internship Programmes/Dissertations**
  
- **Bioanalytical & Comprehensive Lab Services**
  
- **Bacterial culture Repository : Supply of cultures**
  
- **Instrument Utilization**

## **Certificate Course in Basic & Applied Bioinformatics**

### **1) Program Objectives**

- The Certificate Course in Bioinformatics is offered as a program ideally suited for Post Graduate students, Research Scholars, Post-Doctoral fellows and working professionals who wish to gain knowledge and practical experience in bioinformatics.
- This Course will allow students to gain core competency in bioinformatics for real-world applications from genomic medicine to agriculture. No previous programming or database experience is required but a familiarity with molecular biology concepts is recommended.
- Life Sciences with the expertise in Bioinformatics will join the next generation of research and professionals to play a key role in interdisciplinary teams bridging life Sciences and Computational Sciences.

### **2) Academic Outcomes**

- 1) Earn credential from a highly reputable bioinformatics program to advance your career
- 2) Earn graduate level college credits that can be applied towards a Master's or PhD degree program
- 3) Gain core competency for rapidly growing bioinformatics job opportunities in fields from genomics, pharmaceuticals and health care to big data analytics
- 4) Gain knowledge and experience in bioinformatics and systems biology methods and tools and practical programming and database skills for real-world applications
- 5) Learn in an interactive, experiential and multidisciplinary team environment that couples lecture-based instructions with hands-on exercises and term projects

### **3) Target Group/ Eligibility**

Students pursuing their studies in B.Sc./ M.Sc./ B.Tech/ M.Tech in Biotechnology, Microbiology, Biochemistry, Molecular Biology, B. Pharma/ M. Pharma and Research Scholars & faculty members in the field of life sciences.

## **Certificate Course in Plant Tissue Culture and Applications**

Plant Tissue Culture has become an important alternative where any plant species can be cloned and a large number of genetically uniform disease-free plants obtained within a short period of time. The technique enables production of plants in a small laboratory space round the year, independent of season. The demand for tissue culture derived plants has been growing exponentially across the globe. A large number of tissue culture based industries are engaged in commercial production of selected plant species in India and abroad.

### **1) Objective of the Training Programme:**

- To train manpower suited to the needs of the industry
- To help the trainees to become an entrepreneur in the said area.
- To equip the trained manpower in the area of plant tissue culture with advanced theoretical and practical knowledge.

### **2) Course content:**

Course will cover orientation lectures along with hands-on experience in a variety of plant tissue culture techniques like –

- media preparation
- surface sterilization of plant material
- aseptic inoculation of explants
- callus induction
- micropropagation and *in vitro* root induction
- anther culture
- protoplast isolation and culture
- acclimatization of tissue culture plants etc.

### **3) Target Group/ Eligibility**

Students pursuing their studies in B.Sc./ M.Sc./ B.Tech/ M.Tech in Biotechnology, Microbiology, Biochemistry, Molecular Biology, B. Pharma/ M. Pharma, Research Scholars & faculty members in the field of life sciences

## Internships/Dissertation/Projects

### 1) Programme objective

Biotechnology is a research oriented knowledge based sector requiring personels skilled in laboratory techniques. Life Science Students in Nagpur region, in general lack these basic skills and hence are outcompeted by students in metros. In response to several inquiries about training programs, HSB plans to initiate Internship programmes to fill the lacunae between the undergraduate and post graduate curricula and the needs of the research field or industry.

We offer internship programmes in:

- Microbiology
- Biochemistry
- Molecular Biology
- Plant Tissue Culture
- Animal Tissue Culture

### 2) Duration

One to Three months

### 3) Eligibility

Students pursuing their studies in B.Sc./ M.Sc./ B.Tech/ M.Tech in Biotechnology, Microbiology, Biochemistry, Molecular Biology, B. Pharma/ M. Pharma and Research Scholars in the field of life sciences

### 4) Fees Structure

| S.No. | Module                    | Fees per month |
|-------|---------------------------|----------------|
| 1     | Microbiology/Biochemistry | Rs. 5,000/-    |
| 2     | Molecular Biology         | Rs. 10,000/-   |
| 3     | Plant Tissue Culture      | Rs. 6,000/-    |
| 4     | Animal Tissue Culture     | Rs. 10, 000/-  |

## **COMPREHENSIVE LAB SERVICES**

With the vision to promote research & development and to expand the spheres of Biotechnology for society, the institution publicizes the expertise available for consultancy services. The institution renders consultancy services to under graduate and post graduate students and research scholars, faculty members and general public.

We offer services in:

### **Microbiology**

- Antimicrobial testing of samples (Rs.50/- per petriplate)
- Determination of Minimum Inhibition Concentration (Rs.50/- per Set)
- Enumeration of bacteria in the samples (Rs.200/- per sample)
- Microbiological analysis of food, water and environmental samples (Rs.800/- per sample)

### **Animal Tissue Culture**

- Cytotoxicity studies (Rs.1000/- per microtitre plate, excluding the cost of cell line)
- Anticancer studies (Rs.1000/- per microtitre plate, excluding the cost of cell line)

### **Plant Tissue Culture**

- Phytochemical analysis
  - Soxhlet extraction (Rs. 750/- per sample per run)
  - Analytical tests (Rs. 750/- per sample)
  - Thin Layer Chromatography (Rs. 500/- sample, excluding standards)
- Micropropagation of plants (Upon enquiry)

### **Molecular Biology/ Biotechnology**

- DNA isolation (Rs. 500/- per sample)
  - Electrophoresis (Rs. 500/- sample)
  - Gel Doc Picture with analysis (Rs. 100/ per pic)
- Restriction mapping (Upon enquiry)
- PCR (Upon enquiry)

## Supply of Cultures

The department has a collection of microbial cultures which have been purchased from Culture Collection Centres for research purposes through the research grants. The department now wants to create a repository wherein the cultures would be made available for research and teaching purposes.

### **Fees Structure**

Active slants: Rs. 500/- per slant

### **LIST OF ORGANISMS**

| <b>Catalogue No.</b> | <b>MTCC No.</b> | <b>Name of the organism</b>                      |
|----------------------|-----------------|--|
| HSB/HC/1             | 610             | <i>Bacillus amyloliquefaciens</i>                |
| HSB/HC/2             | 869             | <i>Bacillus thuringiensis subsp. israelensis</i> |
| HSB/HC/3             | 441             | <i>Bacillus subtilis</i>                         |
| HSB/HC/4             | 868             | <i>Bacillus thuringiensis subsp. kurstaki</i>    |
| HSB/HC/5             | 1272            | <i>Bacillus cereus</i>                           |
| HSB/HC/6             | 645             | <i>Bacillus mycoides</i>                         |
| HSB/HC/7             | 439             | <i>Enterococcus faecalis</i>                     |
| HSB/HC/8             | 96              | <i>Staphylococcus aureus</i>                     |
| HSB/HC/9             | 740             | <i>Staphylococcus aureus</i>                     |
| HSB/HC/10            | 1652            | <i>E.coli</i> DH5(ALPHA)                         |
| HSB/HC/11            | 78              | <i>pBR322 E.coli</i>                             |
| HSB/HC/12            | 433             | <i>Escherichia coli</i>                          |
| HSB/HC/13            | 1682            | <i>Escherichia coli</i>                          |
| HSB/HC/14            | 426             | <i>Proteus vulgaris</i>                          |
| HSB/HC/15            | 425             | <i>Proteus mirabilis</i>                         |
| HSB/HC/16            | 647             | <i>Pseudomonas aeruginosa</i>                    |
| HSB/HC/17            | 890             | <i>Streptococcus mutans</i>                      |
| HSB/HC/18            | 7056            | <i>Listeria ivanovili</i>                        |
| HSB/HC/19            | 2656            | <i>Chromobacterium violaceum</i>                 |
| HSB/HC/20            | 106             | <i>Micrococcus luteus</i>                        |
| HSB/HC/21            | 440             | <i>Lactococcus lactis</i>                        |
| HSB/HC/22            | 497             | <i>Streptococcus mutans</i>                      |
| HSB/HC/23            | 1826            | <i>Streptomyces torulosus</i>                    |
| HSB/HC/24            | 1537            | <i>Streptomyces varsoviensis</i>                 |
| HSB/HC/25            | 1392            | <i>Streptomyces olivaceus</i>                    |
| HSB/HC/26            | 2506            | <i>Streptomyces nogalater</i>                    |
| HSB/HC/27            | 3257            | <i>Streptomyces purpurascens</i>                 |
| HSB/HC/28            | 1962            | <i>Candida aaseri</i>                            |
| HSB/HC/29            | 227             | <i>Candida albicans</i>                          |
| HSB/HC/30            | 3018            | <i>Candida albicans</i>                          |
| HSB/HC/31            | 1443            | <i>Candida apis</i>                              |
| HSB/HC/32            | 1445            | <i>Candida apicola</i>                           |
| HSB/HC/33            | 4356            | <i>Fusarium oxysporum</i>                        |
| HSB/HC/34            | 2665            | <i>Schizosaccharomyces pombe</i> VAR.Pombe       |
| HSB/HC/35            | 281             | <i>Aspergillus niger</i>                         |

|           |      |                                 |
|-----------|------|---------------------------------|
| HSB/HC/36 | 532  | <i>Rhizobium rhizogenes</i>     |
| HSB/HC/37 | 156  | <i>Fusarium moniliforme</i>     |
| HSB/HC/38 | 964  | <i>Microbispora sp.</i>         |
| HSB/HC/39 | 162  | <i>Rhizopus stolonifer</i>      |
| HSB/HC/40 | 1724 | <i>Mycobacterium phlei</i>      |
| HSB/HC/41 | 170  | <i>Saccharomyces cerevisiae</i> |
| HSB/HC/42 | 160  | <i>Penicillium chrysogenum</i>  |

### Charges of Instrument Utilization

| S.No. | Name of Instruments                 | Make & Model   | Charges (Rs.)       |
|-------|-------------------------------------|----------------|---------------------|
| 1.    | UV-Vis Spectrophotometer            | Elico          | 100/hrs or 500/8hrs |
| 2.    | Biospectrophotometer                | Elico BL 198   | 200/hrs             |
| 3.    | Real time PCR (without consumables) | Himedia LA1060 | 600/ cycle          |
| 4.    | CO2 Incubator                       | Thermo         | 600/day (24 hrs)    |
| 5.    | Ultra Centrifuge                    | Remi C-24      | 300 / hrs           |
| 6.    | Laminar Air Flow                    | Sonar AVS 2    | 100/ hr             |
| 7.    | Microplate Reader                   | ELX 800 Biotek | 100/ plate          |
| 8.    | Vacuum Concentrator                 | Eppendorf      | 250/hr              |
| 9.    | Shaker Incubator                    | Remi CIS-24    | 50/day              |
| 10.   | Gel Documentation System 18         | Igene 618GD    | 25/ pic             |
| 11.   | Microscope with digital Camera      | Olympus        | 50/sample           |
| 12.   | Fluorescence Microscope             | BA 400fluoro   | 200/ sample         |
| 13.   | Phase Contrast Microscope           | Olympus        | 200/ sample         |
| 14.   | Inverted Microscope                 | Lazer          | 200/ sample         |
| 15.   | Trans illuminator                   | Wilber Lourmat | 100/hr              |
| 16.   | Autoclave                           | Yorco          | 250/cycle           |
| 17.   | Millipore Water System              | Millipore      | 150/ lit            |
| 18.   | Millipore water (de-ionized water)  | Millipore      | 50/ltrs             |
| 19.   | Gel Electrophoresis                 | Genei          | 100/cycle           |
| 20.   | Hot Air Oven                        | Yorco YSI-431D | 50/hrs              |
| 21.   | Rotatory Evaporator                 | Remi           | 300/ 8 hrs          |
| 22.   | Deep Freezer (-20)                  | Blue star      | 50/sample/day       |
| 23.   | Vacuum pump                         | Delvac         | 200/hrs             |

**Excluding chemicals/stains wherever applicable**