

## Revised Advertisement for Institute Website



CSIR - CSMCRI

# CSIR Integrated Skill Initiative

## Skill Development Programme

केन्द्रीय नमक व समुद्री रसायन अनुसन्धान संस्थान  
(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद, भारत)  
गिजूभाई बधेका मार्ग, भावनगर 364002 (गुजरात)



CSIR Integrated Skill Initiative

### CSIR- Central Salt & Marine Chemicals Research Institute

Gijubhai Badheka Marg, Bhavnagar-364002, Gujarat (INDIA)

“CSIR-Integrated Skill Initiative” is a national program on skill development initiated by Council of Scientific and Industrial Research (CSIR) using the expertise and infrastructure of CSIR laboratories positioned across the country. CSIR-Central Salt and Marine Chemicals Research Institute (CSIR-CSMCRI), Bhavnagar is a leading constituent laboratory dedicated towards multidisciplinary R&D programs of both basic and applied sciences. Under skill India initiative CSIR-CSMCRI, the only R&D laboratory of CSIR in Gujarat, proposes to organize the following Training programs.

Applications are invited from the eligible candidates for the following training programs as detailed below.

Sr. No.	Name of Training Program	Duration	Maximum No. of Intake	Qualification and Remarks	Last date of application
1.	Plant Tissue Culture and Gene Technology	15 <sup>th</sup> Mar' 21 to 18 <sup>th</sup> Mar' 21	9	BSc. (Passed out) and above	10 <sup>th</sup> Mar,2021 through e-mail only to mangalrathore@csmcri.res.in
2	Fermentation Technology	22 <sup>nd</sup> Mar' 21 to 25 <sup>th</sup> Mar' 21	14	BSc. (Passed out) and above	17 <sup>th</sup> Mar,2021 through e-mail only to sourishb@csmcri.res.in

#### • Course Fee

Rs. 1000/- + Rs.180/- GST = Rs.1180/-	• Category I : Self- sponsored [Students, Individual (other than student) and Entrepreneur (as an individual)]
Rs. 5000/- + Rs.900/-GST = Rs.5900/-	• Category II : Any sponsored candidate (Government, Industry and sponsored by Entrepreneur)

- Fee is non-refundable. Only the selected candidates will be intimated regarding online fee payment (Bank details is attached).
- Mode of communication would be either in हिन्दी or in English.
- Tea (two times) and Lunch will be provided during training program Lodging & boarding arrangements of selected candidates will be done by their own.
- Certificates will be provided to the candidates who successfully complete the course.
- Training venue: CSIR-CSMCRI, Bhavnagar

## How to apply and Selection:

- Maximum numbers of intake are **limited** as mentioned above. Selection will be made on the basis of “first-cum-first-served basis with having fulfilment of qualification criteria, payment and other terms and conditions”. For sending of applications, **payment** and any **query** about the course(s) / training program(s) you can contact by emails mangalrathore@csmcni.res.in (for sr. no. 1) and sourishb@csmcni.res.in (for sr. no. 2).
- One self-attested set of documents to be submitted along with application as attachment.
- All documents in original are required to be shown on the joining day for training program
- The selected candidates will be intimated by email. The Course fee has to be deposited within 3 days of email from us about selection.
- Incomplete applications shall not be considered.
- These are training programs and it would, therefore, not confer any right/claim implicit or explicit for any candidates for claiming extension or absorption in CSIR - CSMCRI/CSIR
- No traveling or any other allowances will be paid to candidate for training program



# CSIR Integrated Skill Initiative

## Skill Development Programme

केन्द्रीय नमक व समुद्री रसायन अनुसन्धान संस्थान

(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद, भारत)

गिजूभाई बधेका मार्ग, भावनगर 364002 (गुजरात)

**CSIR- Central Salt & Marine Chemicals Research Institute**

Gijubhai Badheka Marg, Bhavnagar-364002, Gujarat (INDIA)



## Application Form (आवेदन पत्र)

1.	Name of the Candidate उम्मीदवार का नाम	:		Photo
2.	Father's / Guardian's Name पिता/ पति का नाम	:		
3.	Date of Birth जन्म तिथि	:		
4.	Category वर्ग	:	General / OBC/ SC / ST	
5.	Address (Permanent) पता (स्थायी)	:		
6.	Address (Communication) पता (पत्र व्यवहार)	:		
7.	Educational Qualifications शैक्षणिक योग्यता	:		
8.	Phone No. फोन/ मोबाइल नंबर	:		
9.	E mail ईमेल	:		
10.	AADHAAR Card Number आधार कार्ड नंबर	:		
11.	Training opted for: (put tick mark / write) प्रशिक्षण के लिए (टिक मार्क लगाएं / लिखें)	:	Plant Tissue Culture and Gene Technology Fermentation Technology	
				Candidate's Signature उम्मीदवार के हस्ताक्षर
Details of enclosures				

## **Skill Development Program on “Plant Tissue Culture and Gene Technology”**

**Brief Job Description for Trained Person:** The person will be responsible for selection of material for tissue culture establishment, media preparation, culture generation, culture multiplication, plant production, and quality control etc. in plant tissue culture and biotechnology industries.

**Personal Attributes:** The individual should have basic knowledge of plant propagation techniques, culture establishment and production of plants. The person should have knowledge of functioning of different instruments pertaining to functioning of plant tissue culture and biotechnology laboratory.

**Course Structure:** The courses will comprise of lectures and hands-on sessions.

Following topics will be covered in the training program

### **A Plant Tissue Culture**

- 1. Basic introduction to plant tissue culture**
  - 1.1 Fundamentals of plant tissue culture
  - 1.2 Organization of plant tissue culture laboratory
  - 1.3 Techniques of plant tissue culture
  - 1.4 Types of cultures- a brief overview
  - 1.5 Basic functioning of commonly used instruments in plant tissue culture
  
- 2. Tissue culture media and its preparation**
  - 2.1 Basic concept of plant tissue culture medium and different types of media
  - 2.2 Components of plant tissue culture medium
  - 2.3 Plant hormones and their applications in plant tissue culture
  - 2.4 Preparation of stocks for plant hormones and media constituents
  - 2.5 Preparation of medium
  
- 3. Sterilization- Culture media and Explant sterilization**
  - 3.1 Disinfection process and its requirement in plant tissue culture
  - 3.2 Types of sterilization and sterilization agents
  - 3.3 Process of sterilization- sterilization of medium, plant hormones, and explant etc.

4. **Types of culture and Culture establishment**
  - 4.1 Types of cultures and their need
  - 4.2 Explant and critical precautions in selection of explant
  - 4.3 A generalized protocol to establish tissue culture of a plant
  
5. **Culture multiplication**
  - 5.1 Multiplication of culture- why and how
  - 5.2 Process of multiplication
  
6. **Plant regeneration, soil transplantation and acclimatization**
  - 6.1 Culture regeneration / organogenesis - why and how
  - 6.2 Shoot and plant regeneration
  - 6.3 Root regeneration- *in vitro* and *ex vitro*
  - 6.4 Soil transplantation
  - 6.5 Acclimation
  
7. **Genetic purity assessment of regenerates**
  - 7.1 Genetic purity - Basic introduction and its requirement
  - 7.2 Process / methods to assess the genetic purity of tissue culture regenerates
  - 7.3 Polymerase chain reaction and its functioning
  - 7.4 Setting up a PCR reaction and product detection on agarose gel
  - 7.5 An introduction to RAPD and AFLP markers for genetic purity assessment
  - 7.6 ISSR and SSR markers for genetic purity assessment
  
8. **Commercial aspect of plant tissue culture**
  - 8.1 Application of plant tissue culture
  - 8.2 Successful stories
    - 8.2.1 Banana tissue culture
    - 8.2.2 Date Palm tissue culture
    - 8.2.3 Bamboo tissue culture
    - 8.2.4 Santalum tissue culture
  - 8.3 Potential plant species for tissue culture

## **B Gene Technology**

### **1. Introduction to Gene technology**

- 1.1 Basic concept of Gene technology
- 1.2 Importance and Commercial applications

### **2. Isolation and quantification of DNA**

- 2.1 Isolation of plasmid DNA from *E coli*
- 2.2 Isolation of genomic DNA from plants
- 2.3 DNA quantification by Nanodrop

### **3. Bacterial cell culture and genetic transformation**

- 3.1 Preparation of competent *E coli* bacterial strain
- 3.2 Transformation of *E coli*
- 3.3 Screening of transformants

### **4. Polymerase chain reaction (PCR) for commercial application**

- 4.1 Basic concept and principles of PCR
- 4.2 Components of standard PCR reaction
- 4.3 Running a standard PCR reaction
- 4.4 Commercial applications of PCR technique

### **5. Genetic transformation of model plant**

- 5.1 Preparations for genetic transformation
- 5.2 Co-culture and regeneration of transformants

### **6. Selection of positive transformant- GUS and PCR assay**

- 6.1 Screening of positive transformants
- 6.2 GUS assay
- 6.3 PCR assay

## **Skill Development Program on “Fermentation Technology”**

Course Structure: The courses will comprise of lectures and hands-on sessions.

Salient Features of the programme:

- ❖ 30% Theory and 70% practical sessions as per the course curriculum
- ❖ Tutorials based on specific needs of the candidates.
- ❖ Interactive sessions.
- ❖ Focus on current needs of fermentation industry.

Following topics will be covered in the training program

### **Basic learning modules**

- ❖ Training on fermentation principles.
- ❖ Bioreactor design.
- ❖ Growing microorganisms in fermenter.
- ❖ Hands on pilot scale fermentation experiences.
- ❖ Critical control parameters.

### **Topics to be discussed**

- ❖ Critical components of an industrial bioreactor.
- ❖ Importance of mixing and aeration: Mass Transfer.
- ❖ Scale up of fermentation process.
- ❖ Downstream (purification) process and product formulation.
- ❖ Material and Energy Balance Computations.
- ❖ Process Economics.

### **Practical modules**

- ❖ Detailed understanding of the principles of Fermenter design, microbial fermentation process and production economics.
- ❖ Apply biological and engineering principles in cultivating microorganisms in fermenters.
- ❖ Assess parameters critical for fermentation such as aeration, agitation and  $K_a$  estimation.
- ❖ Attain practical skills on fermenter sampling, product yield and microbial growth estimation, harvesting of culture and cleaning of fermenter.
- ❖ Analyze problems encountered during fermentation process.