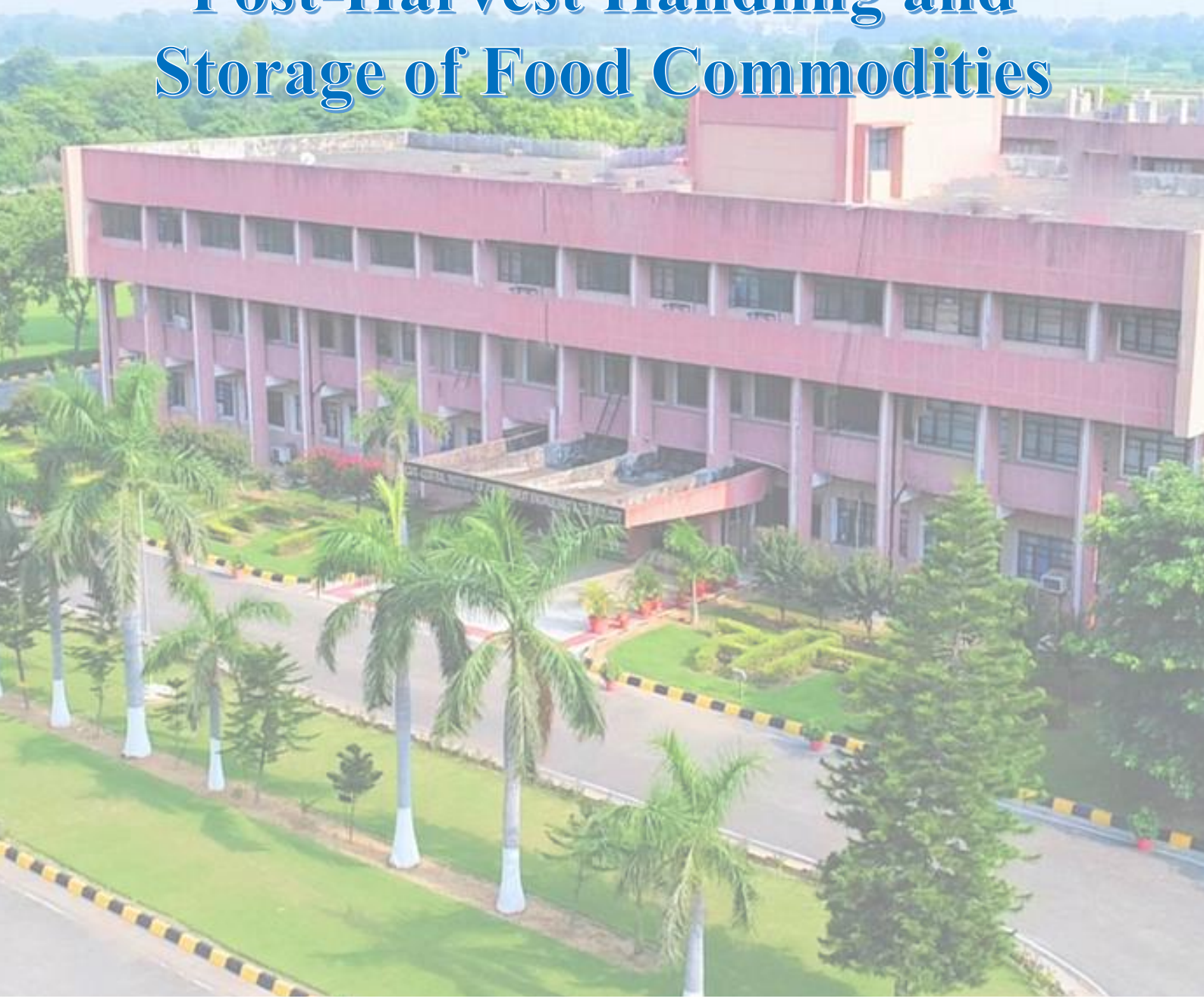


2023



*Certificate Course on*

# Post-Harvest Handling and Storage of Food Commodities



भारतभन्नु-केन्द्रीय कटार्इ-उपरांत अभियांत्रिकी एवं प्रौद्योगिकी संस्थान,  
लुधियाना-141 004 (पंजाब)

**ICAR-Central Institute of Post-Harvest Engineering and Technology  
Ludhiana-141 004 (Punjab), India**  
(ISO 9001:2015 Certified)

## Background

Post-harvest management, including the processing of agricultural products, is crucial for addressing concerns of food security and agricultural value chains. It reduces losses and spoilage while increasing the value of a variety of commodities. A significant paradigm change is visible in post-harvest interventions with renewed emphasis on improving process effectiveness, nutritional security, and food safety. ICAR-CIPHET has been providing necessary impetus for this change. This certificate course is designed to impart the participants the basic and applied knowledge involved in scientific handling and storage of food commodities because a grain saved is a grain produced.

## About ICAR-CIPHET

Central Institute of Post-Harvest Engineering & Technology Ludhiana, Punjab is a nodal institute under the umbrella of Indian Council of Agricultural Research (ICAR). The institute was established in 1989 on October 3, and now has two stations with head quarter at Ludhiana and regional station at Abohar. Institute works for R&D of post-harvest mechanization, processing and value addition of commodity of agriculture and allied sector. The institute is also a coordinating centre for two All India Coordinated Research Projects (AICRP's)- i.e., Post-Harvest Engineering Technology (PHET) and Plastic engineering in Agriculture Structures and Environment Management (PEASEM) and a Consortium Research Platform on Secondary Agriculture (CRP on SA). The institute presently hosts five divisions namely, Automation and Sensor Technology (A&ST), Agricultural Structures and Environment Control (AS&EC), Food Grains and Oilseeds Processing (FG&OP), Horticultural Crop Processing (HCP) and Transfer of Technology (TOT). The institute also has a Krishi Vigyan Kendra (KVK) at Abohar campus.



## Facilities at ICAR- CIPHET

The institute has well established and well-equipped laboratories and the workshop. The laboratories are equipped with the sophisticated research facilities and equipment, major ones like High Performance Liquid Chromatography (HPLC), Atomic Absorption Spectroscopy (AAS), Texture Analyzer, Particle Size Analyzer, Supercritical Fluid Extraction (SCFE), Gel Permeation Chromatography (GPC), Rapid Visco Analyzer (RVA), Tintometer, Thermocyclers, Rheometer and many more. The workshop has all the equipment required basically for machine design and fabrication. Some important laboratories include non-destructive quality evaluation lab, bioengineering properties lab, food packaging lab, drying lab, product development lab, biotechnology and biochemical engineering lab, storage pest management Laboratory and others. In addition to it, Dhal mill and pilot plants for Protein isolation and extraction, millet processing, chilli processing, makhana processing etc., are also available for hands on experience. It also has unique facilities like a Post-Harvest Engineering Machinery and Testing Centre (PHEMTC), Agri Business Incubation (ABI) Centre, Agro Processing Centre (APC) and Food Testing Laboratory (FTL).

## Guest House

The institute has guest house facility with the capacity to accommodate up to 25 individuals simultaneously. The institute benefits from excellent road connectivity, offering convenient transportation options such as rental cars, hired autos, and rickshaws. This ensures easy accessibility and facilitates smooth transportation for individuals.



## About the Programme

The course is designed to provide students with a comprehensive understanding of the latest trends and practices in the field of post-harvest handling issues and storage conditions of food commodities. The course will cover a range of topics, including industry best practices, emerging technologies, and practical skills. Throughout the 6-month course, students will have access to expert instructors who will guide them through the course material and provide them with personalized feedback and support. Students can also connect with industry experts during the program to build their professional network. Upon completing the course, students will receive a certificate to add to their resume and showcase their newly acquired skills. This will help them stand out to potential employers and advance their careers. Major emphasis will be given to the hands-on training.

## Course Duration & Intake

**Course duration: 6 months (October 2023 to March 2024)**

**Total Intake capacity: 20 seats** (Provision of 20% additional seats for Industry sponsored candidates)

Residential timing starts from Oct-2023. The course is divided into three modules includes (1.) Lectures/ Theory classes (2.) Practical/ Hands-on training/ Demonstrations (3.) Exposure visits/ internship with private industries dealing with the subject. The program consists of different topics to be covered in six months which are included in all these modules.

## Pedagogy



## Eligibility Criteria

- The Essential educational qualification required is **Bachelor's degree**. The candidate must hold a valid Bachelor's Degree with at least 50% marks or equivalent CGPA.
- Good communication skills and knowledge of computer and statistical analysis is desirable for the course
- **No age limit.**

## How to Apply

- Application forms are available online <https://ciphet.icar.gov.in/> . The filled in application form along with the paid fee receipt should be submitted through mail to [director.ciphet@icar.gov.in](mailto:director.ciphet@icar.gov.in) or [manju.bala1@icar.gov.in](mailto:manju.bala1@icar.gov.in) and the hard copies should be sent through post to the Course Director, ICAR-CIPHET, P.O.PAU Campus, Ludhiana-141004, Punjab or
- Application fee: Rs.200/- (Rupees Two hundred only) for general category and Rs.100/- (Rs. One hundred only) for SC/ST, payable through NEFT/ RTGS/ Online banking in account

Institute Account Name - ICAR UNIT-CIPHET, Ludhiana

Account Number – 10088205832

IFSC Code - SBIN0001482

Branch Name – SBI, PAU Ludhiana

**Cash payment will not be received.**

- Valid documents: ID Proof- Aadhar Card (preferably)/Voter ID/Driving Licence/Passport/Ration Card.

## Important Dates to Remember

Particulars	Due date
Application opens on	28 <sup>th</sup> August 2023
Last date for applying	15 <sup>th</sup> September 2023
Intimation to the selected candidates	18 <sup>th</sup> September 2023

## Selection Procedure

Selection will be done purely on merit basis.

Screening test will be conducted if applicants crossed double, the seats required for the course. Shortlisted candidates are again subjected to in-person interview. The decision of the Director, ICAR-CIPHET, Ludhiana will be final and binding in all respects.

## Monitoring and Evaluation

Grading System: Participation and competency certificates will be awarded to qualifying students based on their involvement and performance.

Duration of the programme

- Six months residential course
- It is mandatory to complete the entire course and project work to qualify for the certificate.

Evaluation: The candidates will be evaluated based on their involvement and performance in the lectures and practical sessions, assignment, presentations, and final exam. A candidate is required to score 50 percent marks in each component. In addition, it is mandatory to complete all the scheduled activities and project work to qualify for the award of certificate.

## Course Fee

Fee structure: Course fee is Rs 30,000/- (Rupees thirty thousand only) (the fee doesn't include food and accommodation). The boarding and lodging facility will be available on a paid basis in the institute premises.

## General Regulations:

The general guidelines and regulations are as per 'ICAR Rules and Guidelines for Professional Service Functions' and are mandated with Indian Council of Agricultural Research.

## Course Content



## Syllabus

Course code (Credit hours)	Course name and Content
FGOP 01 (1+1)	<b>Food commodities, their storage, supply chain and management -</b> Food commodities- introduction, classification; basics of storage- storage site, conditions, prerequisites; preparation for storage; operations during storage; risk mitigation; preparedness; factors causing storage losses – biotic, abiotic, intrinsic, extrinsic; monitoring and surveillance; pest management; disinfestation; sanitation; heat treatment; fumigation; storage record keeping procedures; supply chain – introduction, units, operation, management.
FGOP 02 (1+1)	<b>Drying and Storage Engineering of Food Commodities –</b> Drying - Theory, principles, mechanism, and methods; Moisture content, determination, equilibrium moisture content (EMC); drying and dehydration of agricultural products; dryers- types, designs; refrigeration load; air pressure; Storage engineering – introduction and importance; storage capacity estimate models, ecology, storage factors affecting losses, storage requirements.

<b>FGOP 03 (1+1)</b>	<b>Storage structures, handling and packaging of food commodities –</b> Storage Systems - Bag and bulk storage, CAS, MAP, CAP and others; Storage structures - godowns, bins and silos; Types of storage facilities – short-, medium- and long-term; Introduction to refrigeration engineering; Handling of food commodities – manual and mechanical; Grain markets; Packaging – design, characteristics; operation of handling machinery and equipment.
<b>FGOP 04 (1+1)</b>	<b>Quality assessment and monitoring of food grains and other durable crops –</b> Introduction to food grains and other durable crops; Physical properties of durable food commodities; raw and milled products quality evaluations: parboiling, drying, terminal velocities of grains and their fractions; basics of value addition; sampling and analysis of basic quality parameters; protocols of quality assessment; proximate analysis of food grains; microbiological analysis of food grains; adulteration- introduction, adulterants, detection; quality control – introduction and protocols.
<b>FGOP 05 (1+1)</b>	<b>Quality assessment and monitoring of perishable crops –</b> Importance of postharvest technology of fruits, vegetables and other perishables; minimal processing; post-harvest physiology, biochemical changes; Rapid Quality Evaluation Techniques; fruit ripening; food spoilage – factors, early detection and management; ethylene physiology; bio-components analysis; senescence; pack house operations; Sampling Procedures, Calibration and Standardization: Sub- sampling; Spectroscopy techniques; Chromatography Techniques.
<b>FGOP 06 (2+0)</b>	<b>Regulatory and legal aspects of food storage –</b> Storage agencies of India – FCI, CWC, SWCs, WDRA, NAFED, APEDA, NCCF, and other; Bureau of Indian Standards; Food Safety and Standards (FSS); FSSAI; Acts and regulations for food storage; sanitary and phytosanitary measures (SPS); Codex Alimentarius; EU Food Safety Standards; The European food safety authority (EFSA); Hazard Analysis & Critical Control Points (HACCP) guidelines; Grain Fumigation for Export; Law of trading horticultural Products; Adequacy of thermal processing; Regulations on Irradiated foods.

## Important Information

1. A graduate in any discipline irrespective of age group across India, is eligible.
2. Selection will be made purely on merit basis. Screening test will only be conducted if applicants crossed double, the seats required for the course. Shortlisted candidates are again subjected to in-person interview. The decision of the Director, ICAR-CIPHET, Ludhiana, will be final and binding in all respects.
3. The medium of instruction and examination shall be English.
4. The selected candidates must submit all their original documents at the time of admission for their verification and to initiate their official admission procedures. If desired, any required affidavits/ testimonials must be strictly according to the format provided as per additional requirements.
5. The academic session of this course is of 6 months consisting of 20-24 weeks.
6. The programmes of this certificate course will run on Credit System and is consisted of six courses to be completed compulsorily.
7. The courses are designed to include lectures, tutorials, practical, field work, project work, assignments, presentations, exposure visit, internship and exams. Thus, it is a complete package for a candidate to acquire knowledge and expertise in post-harvest handling and storage of food commodities.
8. The candidates who will be admitted in the certificate course are not allowed to engage in any alternate full-time activities, as residential period mentioned in the prospectus is compulsory.

9. The selected candidates need to submit the character certificate from his/her immediate previous position/ working/ education place.
10. Absence from the course curriculum without permission is not encouraged to continue the course and in such case the ICAR-CIPHET has the right to cancel the admission of the candidate.
11. ICAR-CIPHET shall not be responsible for any losses happened in any case to any candidates, happened due to their mere ignorance or happened during non-permitted cases.
12. All the selected candidates have to abide by the rules of the ICAR-CIPHET, Ludhiana.
13. The Course Director in all capacity is the competent authority to decide all other matters related to this certificate course.
14. ICAR-CIPHET reserves the right to cancel the admission sought by misrepresentation/ concealment of facts or admission made due to error/oversight, etc.
15. The decision of Director, ICAR-CIPHET in all respect is full and final. Any issues connected with the certificate course and institute along with its activities including the course rules will be subject to the jurisdiction of the Courts situated at Ludhiana.
16. All the important information from time to time will be made available on ICAR-CIPHET website at <https://ciphnet.icar.gov.in>

## Guidelines regarding application for admission

- The candidates are advised to go through the Prospectus and study the admission rules carefully.
- The candidate should ensure that he/she fulfils the prescribed qualification for admission before filling the application form as mentioned in the Prospectus 2023.
- The candidates are advised to visit ICAR-CIPHET website <https://ciphnet.icar.gov.in> regularly to check the updates.
- The information related to course structure/ syllabus and other relevant materials are given in prospectus.

## How to apply

- Candidates can apply as under (Download prospectus and read it carefully before applying).
- Applicants can download the prospectus and application forms from the website.
- All columns in the application form should be filled in and written carefully and legibly by the candidate in his/her own handwriting. Incomplete application form is liable to be rejected.
- The prospectus contains the account details of the institute.
- The candidates have to pay Rs. 200 (general) or Rs. 100 (SC/ST) through NEFT/ Online banking and print the receipt.
- The receipt should be attached with the filled in applications form and can be submitted through mail to [director.ciphnet@icar.gov.in](mailto:director.ciphnet@icar.gov.in) or [manju.bala1@icar.gov.in](mailto:manju.bala1@icar.gov.in). The hard copy of the submitted application along with all the attachments to be sent through post to Director, ICAR-CIPHET, P.O. PAU Campus, Ludhiana-141004, Punjab.
- Two clear and recent passport size coloured photographs need to be submitted with the application form.
- For any queries regarding the certificate courses, one can call to phone 0161-2313101 or +91 8073129511 or +91 9478263275.
- Candidates must ensure that e-mail address and mobile number provided in the application form are their own as the same shall be used by the ICAR-CIPHET to convey the important Information / communication.
- The application form is available online at <https://ciphnet.icar.gov.in> from 28<sup>th</sup> August 2023 till 15<sup>th</sup> September 2023, the last date for applying. The selected candidates will receive the confirmation email latest by 18<sup>th</sup> September 2023.



## Important Dates to Remember

Particulars	Due date
Application opens on	28 <sup>th</sup> August 2023
Last date for applying	15 <sup>th</sup> September 2023
Intimation to the selected candidates	18 <sup>th</sup> September 2023

### Course Director

**Dr. Nachiket Kotwaliwale**

Director

ICAR-Central Institute of Post-Harvest Engineering and Technology (CIPHET)

P.O. PAU Campus, Ludhiana-141 004 (Punjab), India

Tel: 0161-2313101/ 0161-2308670 (Fax)

Email: [director.ciphet@icar.gov.in](mailto:director.ciphet@icar.gov.in)

Website: <https://ciphet.icar.gov.in/>

### Course Coordinators

**Food Grains and Oilseeds Processing Division, ICAR-CIPHET, Ludhiana**

**Dr. Manju Bala**, Principal Scientist and Head

**Dr. Deepika Goswami**, Senior Scientist

**Dr. Swati Sethi**, Scientist

**Dr. Chandan Solanki**, Scientist

**Dr. Pankaj Kumar**, Scientist

**Dr. Guru P. N.**, Scientist



भाकृअनुप  
ICAR



भाकृअनुप-सीफेट  
ICAR-CIPHET

### Contact for queries

**Dr. Chandan Solanki**, Scientist

Ph: 0161-2313223, Mobile: **+91 9478263275**

**Dr. Guru P. N.**, Scientist

Ph: 0161-2313139, Mobile: **+91 8073129511**



भाक अनुप - सीफेट  
ICAR-CIPHET



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किसानों का हमसफर  
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## ICAR-Central Institute of Post-Harvest Engineering and Technology (CIPHET)

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(An ISO 9001:2015 Certified Institution)

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Website: <https://ciphjet.icar.gov.in/>

### DISCLAIMER

The statements made in the Prospectus and all information contained herein are believed to be correct at the time of publication. However, the ICAR-CIPHET reserves the right to make changes and additions to the regulations, conditions governing the conduct of students, requirements of qualification, fee and any other information, or statements contained in this Prospectus at any time, without notice. No responsibility will be accepted by the ICAR-CIPHET for hardship or expenses incurred by its students or any other person or Persons for such changes, additions, omissions or errors; no matter how they are caused.