



INFORMATION BROCHURE

ICAR-Sponsored Winter School

Emerging Technologies in Precision Farming & Water Management

Integrating AI, IoT, and Automation for
Water & Food Security

 (December 8 – 28, 2026)



Sponsored by

**Indian Council of
Agricultural Research**

New Delhi

Organized by

**ICAR–Central Institute
of Agricultural Engineering**

Nabibagh, Berasia Road,
Bhopal – 462038, Madhya Pradesh

 ciae.res.in

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Course Leadership



Course Director

Dr. R. K. Singh
Principal Scientist



Course Co-Directors

- Dr. Ajita Gupta • Scientist
- Dr. R. D. Randhe • Scientist
- Dr. Mukesh Kumar • Senior Scientist



Background

Water is one of the most critical resources for sustainable agricultural production and food security. Increasing pressure on water resources, climate variability, declining water-use efficiency and growing demand for food necessitate the adoption of efficient and intelligent approaches to agricultural water management.

Recent advances in precision agriculture, Artificial Intelligence (AI), Internet of Things (IoT), sensors, remote sensing, Geographic Information Systems (GIS), data analytics and automation are providing new opportunities for transforming conventional irrigation and water-management practices. Real-time monitoring of soil moisture, weather, crop and irrigation parameters can support timely and site-specific irrigation decisions, while AI and machine learning can assist in prediction, optimization and decision support. IoT-enabled systems and automated irrigation technologies can further facilitate remote monitoring and precise control of irrigation operations.

In this context, the 21-day ICAR Winter School on “Emerging Technologies in Precision Farming and Water Management, integrating AI, IoT, and Automation for Water and Food Security” is being organized at ICAR–Central Institute of Agricultural Engineering, Bhopal. The training will provide participants with an integrated understanding of emerging technologies for efficient agricultural water management through expert lectures, hands-on sessions, demonstrations, laboratory and field exposure, and farmers’ field visits.

Objective

The main objective of organizing winter school is to emphasize smart irrigation, IoT-based water management, irrigation water requirements, efficient irrigation management, micro-irrigation, solar-powered irrigation, GIS and Google Earth Engine for agricultural water management, sensors, remote sensing, AI/ML and automation. The training aims to strengthen the capacity of researchers and professionals to

develop and apply technology-driven solutions for efficient water use, improved water productivity and sustainable agricultural production.

Course content

The content (lectures, hands-on practical and field visits) of the winter school has been designed to cover broadly the following:

- Demonstration and hands-on training with electronics and IoT components.
- Machine learning and deep learning libraries and algorithms in Python.
- Drone demonstrations in laboratory and field conditions.
- Hands-on micro-irrigation components and maintenance.
- Arduino board for IoT applications.
- Digital soil mapping concepts and hands-on practice.
- Laboratory, institute, industrial and farmers’ field visits

Eligibility for participation

The training programme is open to Scientists/Teachers/Subject Matter Specialists/ Professionals of ICAR Institutes/CAU/SAUs/KVKs involved in research, development and extension programmes. The eligibility criteria for the course are:

- Master’s degree in Agricultural Engineering / Irrigation and Drainage Engineering / Soil and Water Conservation Engineering/ Agronomy/Hydrology/ Any other relevant discipline from any of the recognised universities.
- Working in a position not below the rank of Scientist / Assistant Professor / Lecturer / Subject Matter Specialists or Equivalent.

How to Apply

Participants are requested to send advance scanned copy of the nomination through email at icarciaewinterschool@gmail.com.

Also requested to take a printout and send duly signed copy through proper channel to the Course Director of Winter School by post along with registration fee, at the address and contact details given in the brochure. Please free to contact the Course Director for any assistance. The last date

for receiving the nomination is 10th November, 2026.

Registration Fee

The participants are required to pay a sum of Rs. 50/- (Rupees Fifty only) as registration fee (Non-refundable) along with the completed application in the form of Demand Draft drawn in favour of ICAR UNIT-CIAE, BHOPAL payable at Bhopal.

Boarding and Lodging

Free lodging and boarding will be provided to the participants as per the approved ICAR norms on sharing basis. The Institute has a furnished guesthouse/ hostel with dining, recreation and medical facilities in the campus. **Please note that, strictly no accommodation in the guest house will be provided to the family members or guests of the participants.**

Travel

Participants will be paid travel fare to and fro through the shortest route from their respective institution to CIAE, Bhopal and back for journey by AC-II class train fare or bus as the case may be. TA to be paid on production of a certificate or tickets by the participant. No air fare will be provided.

How to Reach

CIAE Bhopal is well connected by air, rail and road. Pre-paid auto rickshaw and taxi can be availed at railway station to reach CIAE Bhopal campus.

About CIAE

The Central Institute of Agricultural Engineering (CIAE), was established by ICAR on Feb.15, 1976 at Bhopal (M.P.). The CIAE is a premier Institute in the country to conduct basic, applied and adaptive research in Agricultural Engineering. Organizing specialized training courses for human resource development is a major commitment of the Institute to upgrade the skills of engineers, scientists, subject matter specialists, farmers, artisans, manufacturers and

planners engaged in the promotion of agricultural mechanization in the country.

The Institute campus located at Nabibagh on Bhopal-Berasia Road, 7 and 8 km, from Bhopal station and Raja Bhoj airport respectively, is situated at 77°20'E longitude and 23°20'N latitude at an elevation of 495 m above mean sea level. During December, the max. temp. normally varies between 25-27°C while min. is about 10-12 °C. Woolen clothes will be required during winter school period.

Correspondence address

Course Director

Dr. R.K. Singh

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Important Dates

Last date for receipt of applications: 10.11.2026
Intimation to selected candidates: 15.11.2026
Confirmation by selected candidates: 20.11.2026

NOTE: Once selected, candidates are requested to scan the provided QR code/link



(<https://forms.gle/ha36EYdT1KzjtaBc6>) to submit their basic information and travel plans.

Application form
ICAR- Winter School on

**Emerging Technologies in Precision Farming and Water
Management, Integrating AI, IoT, and Automation for Water and Food
Security**

(08-28 December, 2026)

1. Full name (in BLOCK letters):
2. Designation:
3. Present employer and address:
4. Address to which reply should be sent (in BLOCK Letters)
5. Mobile No.: E-mail:
6. Permanent address:
7. Date of Birth
8. Sex: Male/Female
9. Teaching/research/ professional experience (mention post held during last 5 years and number of publication with details).
10. Mention if you've participated in any seminar/summer/winter school/short course etc. during the previous year under ICAR/other organizations
11. DD No./Ref. No. Dated of Rs. 50/- (NON REFUNDABLE) for registration of
application (DD in favour of ICAR UNIT-CIAE, BHOPAL) payable at Bhopal. Payment may also be made through online (NEFT/RTGS) in the account of **ICAR Unit-CIAE, Bhopal**, A/c No. 10470972113, IFSC Code: SBIN0010144
12. Academic record: (Degree onwards)

Examination passed	Subject	Year	Division	University
Bachelor				
Master				
Doctorate				
Post-doc.				

Signature of applicant with date and place

13. Recommendation and certificate of sponsoring Institute

Signature with date, designation & address

(office seal)