



ICAR - INDIAN AGRICULTURAL STATISTICS RESEARCH INSTITUTE

Senior Certificate Course on Agricultural Statistics and Computing

Hybrid Mode • 26 November 2026 - 21 May 2027

06

MONTHS

02

MODULES

20

SEATS (Maximum)

06

PAPERS

About the Institute

ICAR-IASRI, New Delhi is a premier Institute, established in 1959, mainly responsible for conducting research and imparting education/ training in the field of Agricultural Statistics, Computer Applications and Bioinformatics. There are six divisions in the Institute. The Institute is equipped with modern facilities that include the computing facilities with latest hardware and software packages along with modern teaching aids, the e-library with rich collection of books and journals on Statistics, Computer Science, Bioinformatics and other related disciplines including on-line journals and bibliographic databases.



Course Focus

This course aims to enhance analytical and computational skills of agricultural researchers, with emphasis on data-driven decision-making, reproducible research, and modern statistical computing tools. The course is practical-oriented, with strong emphasis on interpretation, visualization, and real-world applications.

Overview & Eligibility

Two independent modules of three months each, delivered in hybrid mode.

Eligibility

Employed professionals / Individuals holding B.Sc./B.Tech./M.Sc./M.Tech. in Agriculture and allied subjects (including Animal Husbandry, Veterinary Science, livestock, Dairy, Engineering, Fisheries, Forestry etc.)/Maths/ Statistics/ Computer Science/ or equivalent degree from any University or Institution recognized by ICAR/UGC. Only those candidates with sufficient knowledge of statistical methods and computer use may be directly admitted to Module II.

Nomination

Interested personnel fulfilling the eligibility conditions may apply through proper channel and mail the application to the Incharge, Training Administration Cell, on or before 17 November 2026.

Examination

Candidates will appear in an examination at the end of each module. Successful candidates will receive a module certificate; those completing both modules will be awarded the full course certificate.

COURSE STRUCTURE

Module I

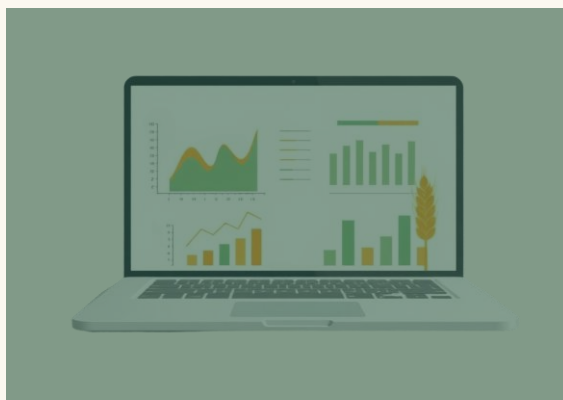
26 November 2026 - 22 February 2027

Paper I – Statistical Methods and Official Agricultural Statistics
Paper II – Use of Computers in Agricultural Research

Module II

24 February 2027 - 21 May 2027

Paper III – Sampling Techniques
Paper IV – Design of Experiments
Paper V – Statistical Genetics
Paper VI – Econometrics and Forecasting Techniques



Delivery

A structured series of lectures and hands-on practical sessions covering statistical tools, techniques and software packages, with the main focus on statistical issues arising in agricultural research.

Curriculum — Papers I & II

PAPER I — STATISTICAL METHODS AND OFFICIAL AGRICULTURAL STATISTICS

Statistical Methods

Descriptive statistics and visualization (including interactive dashboards using R/Shiny): Compilation of data, Frequency distributions, Scatter diagram, Graphs, Charts, 3-D charts, Use of Computer-Graphic display of data, Measures of Central tendencies and dispersions.

Probability and Mathematical Expectation: Postulates of probability, Elementary theorems on probability, Conditional probability, Random variables, Probability function. Concept of random variable and mathematical expectation. Concepts and applications of Binomial, Poisson, Normal distribution, Central Limit Theorem. Concepts of regression and correlation, Method of least squares, Multiple regression and Multiple correlation, Partial regression and Partial correlation.

Estimation and Hypothesis testing: Concepts of point estimation and confidence intervals, Hypothesis testing, Simple hypothesis, Composite hypothesis, Tests based on Chi-square, t and F, ANOVA. Introduction to Bayesian statistics and resampling methods.

Agricultural Statistics

Agricultural systems' statistics in India and globally: Scope and conduct of agricultural statistics-Basic and current agricultural statistics-Systems of collection in India and other countries-Methodological aspects of crop estimation and forecasting-improvements affected in Indian Agricultural Statistics in recent years. Agricultural census and livestock statistics. Use of remote sensing, GIS, and digital agriculture data sources. Integration of big data in agricultural statistics.

PAPER II — USE OF COMPUTERS IN AGRICULTURAL RESEARCH

Computer Fundamentals: Number systems, functional units of a computer, I/O devices, primary and secondary memory, system and application software, Windows, MS Office, networking fundamentals, and Internet basics.

Programming fundamentals in python, Algorithm development, problem-solving techniques, flowcharting, stepwise refinement, Introduction to Python: Python Variables, Python Basic Operators, Python Data Types: int, float, characters, Lists, Tuples, Dictionaries, Sets & their comparison, Python Flow Control statements: conditional (if), alternative (if-else), chained conditional (if-elif-else); Iteration: while, for, break, continue, Functions & Modules, Strings & String Operations, Arrays, Python packages: Simple programs using the built-in functions of packages matplotlib, Numpy, pandas etc.

Database Management: Introduction to DBMS, basic database concepts, and organizing, storing, and retrieving data efficiently.

Data science basics: Introduction to data science concepts, data types, data handling, exploratory data analysis, and simple interpretation of data using summaries and visualizations.

Tools & Applications: Basic use of R, RStudio, Python, SPSS and other inhouse software for data processing and analysis, along with introductory exposure to machine learning, cloud computing platforms, and APIs for agricultural data.

PRACTICAL ORIENTATION

Every topic is paired with a hands-on laboratory session on the Institute's computing facilities — real agricultural datasets, reproducible workflows and guided interpretation.

Curriculum — Papers III to VI

Paper III — Sampling Techniques

Sampling versus complete enumeration, Simple random sampling, Sampling for qualitative and quantitative characters. Standard error, Determination of sample size, Stratification and choice of strata-Different methods of allocation, Efficiency of stratification, Cluster sampling (equal and unequal size). Ratio and regression methods of estimation. Two stage sampling (equal and unequal units at both stages). Systematic sampling, Double sampling. Sampling on successive occasions, Non-sampling errors, Planning and organisation of sample surveys. Problems in organizing and conduct of pilot and large-scale sample surveys. Details of surveys conducted by the Institute. Recent Advances in Sampling Techniques.

Paper IV — Design of Experiments

Need for designing of experiments - characteristics of a good design. Basic principles - replication, randomisation and local control. Uniformity trials. Shape and size of plots and blocks. Completely randomised design, randomised complete block design. Latin square design. Graeco latin squares. Youden square design. Balanced incomplete block designs. Simple lattice. Analysis of covariance. Missing plot techniques. Cross-over designs. Factorial experiments - symmetrical factorials, Confounding in symmetrical factorial. Concept of asymmetrical factorials. Split and strip plot designs. Response curves and surfaces, standardisation of fertilizer responses. Combination of results of group of experiments. Transformations. Sampling in field experiments. Optimal designs and computer-aided design generation, High-throughput phenotyping and field trial analytics, Mixed model approaches for experimental data.

Paper V — Statistical Genetics

Mendel's laws, Linkage, sex-linked and sex-limited inheritance, Multiple alleles, Detection and estimation of linkage. Inheritance of characters showing continuous variation, Multiple factor hypothesis, components of variation, estimation of heritability, response to selection, indirect selection, Progeny row trials and compact family block designs. Use of Discriminant function for selection. Progeny testing and sire evaluation. Elements of population genetics, Hardy-Weinberg law, inbreeding and its effects. Introduction to Bioinformatics and Genomics: Genomic resources/ tools; Overview of sequence analysis. Application of AI/ML in Bioinformatics

Paper VI — Econometrics and Forecasting Techniques

Econometrics

Introduction and Scope of econometrics. Econometrics models and other specification. Simple and multiple linear regression models, BLUE properties of least square estimation. Ordinary least squares method of estimation. Properties of least squares estimates, test of significance and confidence interval. Maximum likelihood estimation. Concepts of multicollinearity, heteroscedasticity and autocorrelation, Durbin - Watson test, lagged variables, Dummy variables and index numbers.

Forecasting Techniques

Forecast models using weather variables - regression approach; Forecast models using plant characters - between year models, regression approach, within year models, probability models; Agro meteorological models using stress index, water requirement satisfaction index; Time series models; Linear stationary and non-stationary models, Autoregressive integrated moving average processes, Forecasting agricultural production/ commodity prices/ fish production/ forecasting climatic variables, Multivariate time series, modelling the mean, stationary VAR models, spurious regression, co-integration analysis. Volatility: modelling the variance, The class of ARCH models, properties, analysis of forecasting, Extensions: IGARCH, HRCH-t, GARCH, GJR-GARCH; Forewarning of pests and diseases, Forecasting production; application of remote sensing techniques in forecasting. AI/ML in Agricultural Forecasting

Course Fee & Payment

Fee is payable at the start of each module.

Category	Per Module (3 months)	Both Modules (6 months)
Participants from India	Rs. 20,000	Rs. 30,000
SAARC countries	US \$1,000	US \$1,500
Other countries	US \$2,000	US \$2,500
ICAR employees	No fee	No fee

The fee does not include logistics and meals. Once paid, the fee is non-refundable.

Bank Details (NEFT)

Account Holder: ICAR-Unit-IASRI,Pusa, New Delhi-110012

Bank: Canara Bank

Branch Name: IARI, PUSA Campus, New Delhi-12

Account No: 91421010000017

IFSC: CNRB0019029

Type: Current Account

MICR: 110015498

HOW TO APPLY

01

Check eligibility

02

Fill application

03

Forward through proper
channel

04

Fee payment

ALL CORRESPONDENCE

Dr. Sarika — Course Coordinator & Incharge, Training Administration Cell, ICAR-IASRI

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011-25847284 (Ext. 4315) • +91 97188 33806

Application Form

Agricultural Statistics & Computing

Senior Certificate Course
26 November 2026 - 21 May 2027

1. Module of the course for which nominated _____
2. Full name (in block letters) _____
3. Date of birth _____
4. Basic pay and scale of pay _____
5. Official address _____
6. Telephone number _____
7. Residential address _____
8. Telephone (Res.) / Mobile / Fax _____
9. E-mail address _____

10. EDUCATIONAL QUALIFICATIONS

Degree	University	Subjects	Year

11. TOTAL EXPERIENCE

Post held	Organisation / Office	From	To

12. Have you attended any course by this Institute previously? If yes, give details

13. Bank Draft Details / Transaction Reference and Bank Name

Signature of the Applicant with Date

CERTIFICATE

Certified that the candidate is employed by our Department / Organisation and, on return from the training, will be suitably employed so that the training is best utilised. The candidate would abide by all rules and regulations of the Institute.

Signature of the Sponsoring Authority with Seal and Date