Education and Training

For human resource development programmes, the Institute conducts post graduate teaching and in-service courses in Agricultural Statistics and Computer Applications. Institute conducts M.Sc. and Ph.D. programmes in Agricultural Statistics since 1964 and M.Sc. in Computer Application since 1985-86. A new course M.Sc. (Bioinformatics) has been initiated from 2011-12. A brief description of human resource development during the year is given in the sequel.

DEGREE COURSES

The Institute continued to conduct the following degree courses in collaboration with the Post Graduate School, IARI, New Delhi which has the status of a Deemed University

(i) Ph.D. (Agricultural Statistics)
(ii) M.Sc. (Agricultural Statistics)
(iii) M.Sc. (Computer Application)
(iv) M.Sc. (Bioinformatics)

Both Ph.D. and M.Sc. students are required to study courses not only in Agricultural Statistics but also in Agricultural Sciences like Genetics, Agronomy, Agricultural Economics, etc. The courses in Mathematics, Agricultural Statistics and Computer Application are offered at this Institute while the courses in Agricultural Sciences are offered at IARI.

Number of students admitted/completed various courses during the period under report are:

Courses	Number of Students	
	Admitted	Completed
Ph.D. (Agricultural Statistics)	6	3
M.Sc. (Agricultural Statistics)	8	7
M.Sc. (Computer Application)	4	7
M.Sc. (Bioinformatics)	3	-

Brief of research work carried out by students who had completed various courses during 2011-12 is as follows:

Ph.D. (Agricultural Statistics)

i) Yogita Gharde

Small area estimation for spatially correlated data using bayesian approach

A spatial model for small area estimation was proposed using geographically weighted regression approach when parameters are spatial in nature and it was found that spatial model provided more efficient estimates as compared to non-spatial model. The proposed spatial model was put in Hierarchical Bayes (HB) framework and it was found that the estimates obtained were more efficient than Empirical Best Linear Unbiased Predictor estimates. Three types of spatial weight matrix (Neighbourhood Criteria method, Gaussian-Decay method and Spherical variogram approach) were used to incorporate spatial effects and among three, spherical method of incorporating spatial effect was the best for this model when the sample size was small.

Guide: Dr. Anil Rai

ii) Eldho Varghese

Some investigations on experimental designs incorporating neighbour effects

In agricultural field experiments, in order to control heterogeneity and conserve resources, the treatments are generally assessed using small adjacent units. Under such situation, the treatment applied to one experimental plot may affect the response on neighbouring plots and neighbour balanced block designs are useful for estimating the treatment effects in presence of neighbour effects if there is one source of heterogeneity in the experimental units. Neighbour balanced block designs were studied assuming neighbour effects proportional to the direct effects of treatments and their efficiencies were obtained. To deal with the two-way elimination of heterogeneity settings, row-column designs were obtained considering directional and non-directional neighbour effects from all the four sides. Methods of constructing designs were developed and these designs are found to be totally balanced/ variance balanced for estimating the direct and neighbour effects of treatments. For studying the relationship between response and the intervening levels of quantitative factors, first and second order response surface model were studied under the assumption of differential neighbour effects from both left and right units and the conditions for orthogonal estimation of parameters were derived. A method of obtaining designs satisfying the derived conditions was developed. Blocking aspects in response surface designs in the presence of neighbour effects were also studied.

Guide: Dr. Seema Jaggi

iii) Nitiprasad N. Jambhulkar

Some investigations on minimum aberration for fractional factorials

Minimum aberration fractional factorial plan is one that ensures estimation of maximum number of lower order interaction components under the assumption that higher order interactions are negligible for a given resolution plan. Methods of construction of irregular two level minimum aberration fractional factorial plans of the type $\frac{r}{2^p}(2^k)$ for different values of k and p where $r(< 2^p)$is a prime number, were developed. Minimum aberration fractional factorial plans for $\frac{1}{5^p}(5^k)$ and $\frac{1}{7^p}(7^k)$ level factorial experiments for $4 \leq k \leq 15$ and $1 \leq p \leq 12$ such that $k - p = 3$ were obtained. Minimum aberration fractional factorial plans for mixed level factorial experiments (some factors at 4 levels and rest of the factors at 2 levels each) were also obtained. SAS code was developed for the construction of above minimum aberration fractional factorial plans. Catalogues for the above designs were also prepared which would serve as a ready reckoner to the practicing statisticians and the experimenters.

Guide: Dr. Krishan Lal

M.Sc. (Agricultural Statistics)

i) Nirpum Ghosh

Some investigations on the problem of non-response in the context of repeat surveys

In many sample surveys, the same population is sampled repeatedly and the same study variable is measured at each occasion so that development over time can be followed. For example, labour force surveys are conducted monthly to estimate the number of employed. Similarly, surveys are conducted for estimation of major livestock products wherein data are collected over seasons. It is a common experience, in sample surveys, to come across units in the sample which do not yield the required information at the first attempt. In such situations repeated visits to the non-respondents is necessary. Therefore, the situations where some sample units do not provide the necessary information in the context of surveys on two occasions under a two-stage sampling design were studied. Three different non-response cases were considered under two different sampling schemes. Hansen and Hurwitz technique *i.e.* sub-sampling of non-respondents technique was used to tackle the problem of non-response. Different unbiased estimators of population mean along with their variance expressions were developed to take care of non-response. It was shown theoretically that the proposed estimators were more efficient than the estimators obtained from single occasion sampling strategy. With the help of an empirical study it was shown that, for more precision, it is advisable to retain some second stage sampling units on the current occasion. Further, higher the correlation between units on the first and second occasion, more the precision of an estimator for the current occasion over an estimator which does not utilize previous year information. Also, higher the correlation between the non-responding units, more the gain in efficiency.

Guide: Dr. UC Sud

ii) Kallol Sarkar

A study on row-column designs

Row-column designs are used in agricultural and horticultural research for the control of non-treatment variability in experiments both in field and glass house arising due to two sources of variability in the experimental units. Some families of symmetric/ asymmetric factorial row-column designs in complete/ incomplete rows/columns were obtained for experimental situations wherein the experimenter wants to study the effect of two or more factors simultaneously. Further, for experimental situations in which the experimenter wants to compare a set of new (test) treatments with an already existing (control) treatment, some general methods of constructing balanced treatment-control row-column designs in complete/ incomplete rows/columns were developed. A class of structurally incomplete balanced treatment-control row-column designs was also obtained where treatments were applied to a subset of the available experimental units.

Guide: Dr. Cini Varghese

iii) Mrinmoy Ray

A study on time series intervention modeling in agriculture

Time series intervention modeling in the domain of agriculture is employed in the situations where it may be known that certain exceptional external events called 'interventions' could affect the time series phenomenon. As a case study, cotton yield of India at all-India level and for two major states viz. Gujarat and Maharashtra were considered with the intervention being introduction of Bt Cotton variety in 2002. Of the three types of interventions possible viz. step (when event occurring exists for some period), pulse (when event occurs only at particular period) and ramp (when after the event occurs, its effect increases rapidly), step intervention occurred for all the three datasets considered at varied magnitudes and differential slopes over time. Moreover, the performance of autoregressive integrated moving average (ARIMA) intervention models was also investigated on data sets simulated under different possible situations taking cotton yield data at all-India level as the baseline data set. When cotton yields were forecasted, the performance of ARIMA intervention models was found to be superior to the conventional ARIMA models for all the three locations and also for all the simulated situations. Thus, it was concluded that time series intervention modeling could be usefully employed for forecasting purposes.

Guide: Dr. Ramasubramanian V

iv) Samarendra Das

Some investigations on different classification techniques in agriculture

The performance of classification techniques was investigated for the situations wherein certain assumptions were violated. The classification of genotypes in presence of missing values is a challenging task for breeders. The performance of different classification techniques *viz.* Oblique Axes Method (OAM), *k*-th nearest neighbour (KNN), Linear Discriminant Analysis (LDA) and Quadratic Discriminant Analysis (QDA) were compared based on apparent classification error rate (APER) when some observations were missing. The results showed that KNN followed by OAM and LDA performed better in skew-normal situations than normal condition and QDA performed better in normal condition. For maximum consistency and accuracy of classification of skew-normal data, KNN was best among the four classification techniques. The performance of the four classification techniques were also studied under 1%, 5%, 10% and 20% missing observations created randomly in the original data which were imputed by different methods like zero, mean, regression and multiple imputation methods based on the weighted average hit ratios. The results revealed that all the imputation methods were robust against 1% and 5% missing observations. It was found that mean, regression and multiple imputation techniques performed well in case of 10%, 20% or more missing observations. Among the four classification techniques, KNN technique was robust to the different levels of missing observations.

Guide: Dr. AK Paul

v) Kadar Ali Sarkar

A study of nonlinear ARMA model with time-varying coefficients

The data collected over time are called time-series data and for analysis of this data, linear time-series models are used. These models may not be able to capture the asymmetry (when average number of observations in the up cycle is different from that of down cycle) in the data. To deal with asymmetry in time series data, linear autoregressive time-series model may be extended to nonlinear time-series taking the

autoregressive coefficient as a time-varying coefficient. Random coefficient autoregressive (RCAR) model and Fourier autoregressive (F-AR) model were studied. In RCAR model, autoregressive coefficient follows a stochastic process and in F-AR model that follows a deterministic time dependent coefficient. RCAR model was fitted by representing the model into state space form followed by estimation of parameters using Kalman filter. F-AR model was fitted with minimum number of Fourier coefficients. The two models were compared with fitted autoregressive moving average (ARMA) model based on AIC, BIC value and forecasting performance. Quarterly oil sardine fish catch in Kerala for the period 1985-2008 was considered for building the model and 2009-2010 was used for validation.

Guide: Dr. Himadri Ghosh

vi) Upendra Kumar Pradhan

Designs for mixture experiments with process variable

An experiment in which the response is assumed to depend on the relative proportions of the ingredients present in the mixture and not on total amount of the mixture is called the mixture experiment. Sometimes the response in mixture experiments depends not only on the proportion of mixture components present in the mixture but also on the process conditions. The mixture experiments when conducted with process variables are called mixture experiments with process variables. A method of construction of efficient designs for mixture experiments with process variable in minimum number of runs was developed using the projection matrix and designs were obtained for 3, 4 and 5 components of mixture with one process variable. A methodology for obtaining the optimum combination of ingredients in mixture experiments with process variables was developed by using dual optimizing technique with minimum variability and desired/maximum mean yield when replicated data on different runs was available.

Guide: Dr. Krishan Lal

vii) Kanchan Sinha

A study on combining ARIMA and artificial neural networks for time series forecasting

Agricultural price forecasting is one of the challenging areas of time series forecasting. In this study, an effort was made to compare the forecasting capabilities of well known Box-Jenkins or ARIMA methods with nonlinear time delay neural network (TDNN) models using data on monthly wholesale price of oilseed crops traded in different markets in India. The aim of the study was short term price forecasting up to one year with multiple forecast horizons, namely one, three, six and twelve months. In general, TDNN models outperform the ARIMA models for six and twelve months ahead forecasting in terms of root mean square error. Pitman's statistical test was employed in the present study to compare the one step ahead forecasting performance between TDNN and ARIMA models considering the nonprobablistic feature of neural network models. Nonlinearity test provides a fairly good indication for post sample forecast accuracy of these models. It has been seen that the neural network models have clear advantage for predicting the direction of monthly price change for different series. The sequential combination of ARIMA and TDNN models was adopted to harness the unique strength of individual models was improving the forecast accuracy. The results of the study showed that combined models underperform compared to their components' performances which might be due to the failure of the basic assumption of additive relationship between linear and nonlinear components of this approach for the series considered in the experiments.

Guide: Dr. GK Jha

M.Sc. (Computer Application)

i) Jai Prakash Srivastava

Development of software for cropping system experiments

Experimentation plays key role in improvement of agricultural systems. A web based software for Cropping System Experiments has been developed that provides the season wise results on several aspects of the experimentation. The present system has been designed using three-layered architecture. The software provides the season wise results for analysis that includes Character analyzed, Centre name, Experiment type, Raw and Converted data season wise, ANOVA, Mean table, Standard Error, and Critical Difference.

Guide: Sh. HS Sikarwar

ii) Arijit Saha

Ontologies based expert system for maize

Maize (*Zea mays* L) is the most versatile crop with wider adaptability in varied agro-ecologies. An ontology based Expert System for Maize has been developed.

Ontology is the latest knowledge representation technique that allows the domain experts to code their knowledge in a specific domain. The system currently has about 80 maize diseases, 52 insects and 39 varieties of maize. The system works in question-answer mode and allows the farmers to choose options for each of the question asked. At each level the text is supported by pictures. The present system has a dynamic knowledgebase and acts as a tool for transferring the site and crop specific knowledge of various domain experts to the farmers.

Guide: Dr. Sudeep

iii) AKM Samimul Alam

Web based software development for computation of total factor productivity

Total Factor Productivity (TFP) is an important measure to quantify the productivity growth. Modules for TFP computation are not available in any statistical software and commonly used econometric packages. A web based TFP computation software has been developed. The software provides TFP index, output index and input index using Tornqvist index method. Growth curve of each index is also computed and presented with tables and graphs. Facilities for computing index for single crop and index for aggregate crop have been provided through two separate sub-modules. Facilities for computation of TFP by aggregating data of lower spatial units are also provided.

Guide: Dr. Rajni Jain

iv) Monojit Saha

Strengthening expert system for extension using crop forewarning models

Forewarning of incidence of crop pests and diseases plays key role in improvement of agricultural production. Reliable and timely forecasts provide important and useful input for proper, foresighted and informed planning. A Crop Forewarning Module has been developed that provides the sowing date wise results of forewarning on the basis of weather data available in the database provided by Domain Experts. The system acts as a centralized tool for transferring crop specific knowledge of different pests and diseases gathered by various domain experts to the farmers. Farmers can view the desired forewarning results on the basis of crop name, variety name, particular disease and the sowing date of the crop provided by them.

Guide: Dr. RC Goyal

v) Mrityunjoy Mandol

Software package for knowledge extraction from agricultural field experiments

A large number of agricultural experiments are being conducted under the NARS. A web based software for Agricultural Field Experiments Information System has been developed that provides the results for reporting the agricultural experiments for on-station research. The present system has been designed using three-layered architecture. The software provides the results for reporting the agricultural experiments including Character analyzed, Research centre name, Experiment type, Raw and Converted data season wise crop and variety wise seed rate, spacing, amount of fertilizer and pesticide application for particular crop and the yield of the on-station experiments.

Guide: Sh. HS Sikarwar

vi) Maedeh Zirak Javanmard

Web based fuzzy C-means clustering software

Clustering is an explorative data mining task. In real life applications there is very often no sharp boundary between clusters. For those cases fuzzy clustering has important role to play. In order to carry out fuzzy clustering, a web based fuzzy c-means clustering software (wFCM) has been developed using fuzzy clustering algorithm. wFCM has been designed and developed as per web based three-tier architecture in Microsoft .NET environment. User can upload data to wFCM using three different formats; Excel, CSV and image files. Fuzzy clustering results can be downloaded by the user in excel and PDF formats or viewed graphically. Software results are validated using suitable dataset from machine learning repository. This software will be useful for statisticians, researchers, students and teachers for clustering datasets from agricultural research as well as many diverse areas of other sciences.

Guide: Dr. Alka Arora

vii) Satma MC

Online rule generation software using decision tree classifier

The handling of enormous amounts of data produced in agricultural research for taking appropriate and logical decisions through Expert Systems/Decision Support Systems is of major concern now. e-agriculture is a significantly emerging field focusing on agricultural

development through improved information services. Domain experts generate the input rules manually which is a time consuming process. To overcome this, a web based rule generation software (GenRule) has been developed using the ID3 decision tree classifier. Visualization of the rules is also provided in the form of decision tree. The generated rules are accompanied by various evaluation measures for their validity. GenRule provides the facility to classify future data instances. User can register, login, generate the rules, and can see the results and save in excel, text and XML file for future use.

Guide: Dr. Rajni Jain

Research Fellowship

During 2011-12, 15 Ph.D. and 36 M.Sc. students received Research Fellowship. 13 Ph.D. students received IARI Scholarship @ Rs.10,500/- p.m. in addition to Rs.10,000/- per annum as the contingent grant and 02 Ph.D. students received ICAR SRF Fellowship @ Rs.12,000/- p.m. in addition to Rs. 10,000/- per annum as the contingent grant. 14 M.Sc. students received ICAR Junior Research Fellowship @ Rs. 8640/- p.m. besides Rs. 6000/- per annum as the contingent grant and 22 M.Sc. students received IARI Scholarship @ Rs. 7560/- p.m. besides Rs. 6000/- per annum as the contingent grant.

CERTIFICATE COURSE

Senior Certificate Course in Agricultural Statistics and Computing: 5 participants

The Institute continued to conduct Senior Certificate Course in Agricultural Statistics and Computing, organized for the benefit of research workers engaged in handling statistical data collection, processing, interpretation and employed in research institutes of the Council, State Agricultural Universities and State Government Departments, etc. and foreign countries including SAARC countries with the main aim to train the participants in the use of latest statistical techniques as well as use of computers and software packages. The course is comprised of two independent modules of three months duration each.

The course was organised during 20 June 2011 to 26 November 2011 (Module–I: 20 June to 20 August 2011 and Module–II: 01 September to 26 November 2011). Two officers participated in Module–I only and three officers in both the modules.

The main topics covered under the course include Statistical Methods, Official Agricultural Statistics, Use of Computers in Agricultural Research, Sampling Techniques, Econometrics and Forecasting Techniques, Design of Experiments and Statistical Genetics.

NATIONAL / INTERNATIONAL TRAINING PROGRAMMES

Summary of Training Programmes Organised

Category	Training Programmes	No. of Participants
International	**03**	**21**
National	**16**	**359**
CAFT	02	40
Winter School	02	48
NAIP	09	193
Resource Generation	03	78
Through Outsourcing	**02**	**57**
Total21	**437**	

Details of Training Programmes Organised

S.No.	Title	Venue	Duration	Sponsored by	No. of Participants
	International (3: 21 Participants)				
1.	Application of Remote Sensing and GIS in Agricultural Surveys Course Director: Prachi Misra Sahoo Course Co-Director: Tauqueer Ahmad	IASRI, New Delhi	09-23 September 2011	Afro Asian Rural Development Organisation (AARDO)	07
2.	Forecast Techniques in Agriculture Course Director: KN Singh Course Co-Director: Amrender Kumar	IASRI, New Delhi	17-31 October 2011	Department of Census & Statistics, Sri Lanka	07
3.	Application of Remote Sensing and GIS in Agricultural Surveys Course Director: Prachi Misra Sahoo Course Co-Directors: KN Singh & Tauqueer Ahmad	IASRI, New Delhi	18 January to 07 February 2012	Afro Asian Rural Development Organisation (AARDO)	07
	National (16: 359 Participants)				
	Centre of Advanced Faculty Training (2: 40 Participants)				
1.	Biometrics in Agriculture Course Director: SB Lal	IASRI, New Delhi	29 August to 07 September 2011	Education Division of ICAR	24
2.	Online Content Creation and Management in an e-Learning Environment Course Director: Shashi Dahiya	IASRI, New Delhi	03 -23 January 2012	Education Division, ICAR	16
	Winter School (2: 48 Participants)				
3.	Data Mining Techniques and Tools for Knowledge Discovery in Agricultural Database Course Director: Alka Arora	IASRI, New Delhi	03-23 November 2011	Education Division, ICAR	23
4.	Recent Advances in Designing and Analysis of Agricultural Experiments Course Director: Krishan Lal	IASRI, New Delhi	29 November to 19 December 2011	Education Division, ICAR	25
	National Agricultural Innovation Project (9: 193 Participants)				
5.	Data Analysis Using SAS Course Director: Rajender Parsad Course Co-Directors: Seema Jaggi & Rakesh Goel (Pt. DDUVU&GAS)	Deen Dayal Upadhayaya Veterinary University and Gau Anusandhan Sansthan, Mathura, UP	16-21 May 2011	NAIP Consortium Strengthening Statistical Computing for NARS	28
6.	Data Analysis of Natural Resources Management Research Course Director: Rajender Parsad Course Co-Director: LM Bhar	IASRI, New Delhi	20-25 June 2011	NAIP Consortium Strengthening Statistical Computing for NARS	21
7.	Forecast Modelling in Crops Course Director: Ranjana Agrawal Course Co-Director: Amrender Kumar	IASRI, New Delhi	03-12 August 2011	NAIP, ICAR	22

S.No.	Title	Venue	Duration	Sponsored by	No. of Participants
8.	Genetics/Genomics Data Analysis Using SAS Course Director: Rajender Parsad Course Co-Directors: AK Paul & Sunil Archak (NBPGR, New Delhi)	IASRI, New Delhi	19-24 September 2011	NAIP Consortium Strengthening Statistical Computing for NARS	24
9.	Data Analysis in Social Sciences Research using SAS Course Director: Rajender Parsad Course Co-Director: Sivaramane, N	IASRI, New Delhi	10-15 October 2011	NAIP Consortium Strengthening Statistical Computing for NARS	20
10.	Data Analysis and Interpretation in Farm Implementation and Machinery Research using SAS Course Director: Rajender Parsad	IASRI, New Delhi	14-19 November 2011	NAIP Consortium Strengthening Statistical Computing for NARS	18
11.	Data Mining Using SAS Course Director: Rajender Parsad Course Co-Directors: Samir Farooqi & Anshu Bharadwaj	IASRI, New Delhi	06-11 February 2012	NAIP Consortium Strengthening Statistical Computing for NARS	18
12.	Data Analysis Using SAS Course Director: Rajender Parsad Course Co-Directors: Seema Jaggi & Sunil Kumar (NDUA&T, Faizabad)	NDUA&T, Faizabad	19-24 March 2012	NAIP Consortium Strengthening Statistical Computing for NARS	23
13.	Recent Advances in Statistical and Computational Genomics Data Analysis Course Director: AR Rao	IASRI, New Delhi	19-28 March 2012	NAIP Consortium Bioprospecting of Genesand Allele Mining for Abiotic Stress Tolerance	19
	Resource Generation (3: 78 Participants)				
14.	Statistical Techniques for Data Collection and Analysis Course Director: Seema Jaggi Course Co-Director: Tauqueer Ahmad	IASRI, New Delhi	25 April to 27 May 2011	Department of Agriculture, Government of Andhra Pradesh	21
15.	Data Analysis and Interpretation: Use of Statistical Softwares Course Director: Rajender Parsad Course Co-Directors: Krishan Lal & BN Mandal	IASRI, New Delhi	30 May to 17 June 2011	Central Statistical Organisation, Ministry of Statistics & Programme Implementation	37
16.	Agricultural Statistics Course Director: UC Sud, Course Co-Directors: KK Tyagi & Tauqueer Ahmad	IASRI, New Delhi	26-30 September 2011	Central Statistical Organisation, Ministry of Statistics & Programme Implementation	20
	Through Outsourcing (2: 57 Participants)				
1.	Computational Genome Analysis using ANYAYA Association with Bioinformatics Group of C-DAC, Pune	IASRI, New Delhi	22-24 June 2011	NAIP Consortium, National Agricultural Bioinformatics Grid	37
2.	High Performance Bio-Computing and Drug Design Association with Super Computing Facility for Bioinformatics and Computational Biology (SCFBIO)	IIT, New Delhi	12-22 September 2011	NAIP Consortium National Agricultural Bioinformatics Grid	20

BOARD OF STUDIES FOR ACADEMIC YEAR 2011-12

Agricultural Statistics

1.	Dr. Rajender Parsad, Professor (Agricultural Statistics)	Chairman
2.	Dr. VK Bhatia, Director	Ex-officio Member
3.	Dr. Ranjana Agrawal, Principal Scientist	Member
4.	Dr. Girish Kumar Jha, Senior Scientist, IARI	Member
5.	Dr. Lalmohan Bhar, Senior Scientist	Member Secretary
6.	Dr. Mohan Kumar T.L. (Student Representative)	Member

Computer Application

1.	Dr. PK Malhotra, Professor (Computer Application)	Chairman
2.	Dr. VK Bhatia, Director	Ex-officio Member
3.	Dr. RC Goyal, Principal Scientist	Member
4.	Dr. Rajni Jain, Senior Scientist, NCAP	Member
5.	Dr. Sudeep, Senior Scientist	Member Secretary
6.	Smt. Shashi Dahiya, Scientist (SS)	Member
7.	Sh. Shrikumar Bishwas (Student Representative)	Member

Bioinformatics

1.	Dr. Prajneshu, Professor (Bioinformatics)	Chairman
2.	Dr. VK Bhatia, Director	Ex-officio Member
3.	Dr. KC Bansal, Director, NBPGR	Member
4.	Dr. TR Sharma, Principal Scientist, IARI	Member
5.	Dr. RL Sapra, Senior Scientist, IARI	Member
6.	Dr. Anil Rai, Head, Centre for Agricultural Bioinformatics	Member
7.	Dr. Sunil Archak, Scientist, NBPGR	Member
8.	Smt. Anu Sharma, Scientist	Member Secretary
9.	Sh. Chiranjib Sarkar (Student Representative)	Member

CENTRAL EXAMINATION COMMITTEE FOR ACADEMIC YEAR 2011-12

Agricultural Statistics

1. Dr. VK Bhatia, Director
2. Dr. Rajender Parsad, Head, Design of Experiments & Professor (Agricultural Statistics)
3. Dr. VK Gupta, National Professor, ICAR
4. Dr. Prajneshu, Head, Biometrics and Statistical Modelling
5. Dr. Ranjana Agrawal, Principal Scientist
6. Dr. UC Sud, Head, Sample Surveys

Computer Application

1. Dr. VK Bhatia, Director
2. Dr. PK Malhotra, Head & Professor (Computer Application)
3. Dr. RC Goyal, Principal Scientist
4. Dr. Anil Rai, Head, Centre for Agricultural Bioinformatics
5. Dr. Alka Arora, Senior Scientist
6. Dr. Sudeep, Senior Scientist
7. Sh. KK Chaturvedi, Senior Scientist

FACULTY MEMBERS OF P.G. SCHOOL, IARI IN AGRICULTURAL STATISTICS

S. No.	Name	Year of induction
1.	Dr. VK Bhatia, Director	1987
2.	Dr. VK Gupta, National Professor, ICAR	1984
3.	Dr. Rajender Parsad, Head, Design of Experiments & Professor (Agricultural Statistics)	1995
4.	Dr. Prajneshu, Head, Biometrics and Statistical Modelling & Professor (Bioinformatics)	1984
5.	Dr. UC Sud, Head, Sample Surveys	1995
6.	Dr. Anil Rai, Head, Centre of Agricultural Bioinformatics	1995
7.	Dr. KN Singh, Head, Forecasting and Econometric Techniques	2011
8.	Dr. Ranjana Agrawal, Principal Scientist	1988
9.	Sh. SD Wahi, Principal Scientist	1987
10.	Dr. KK Tyagi, Principal Scientist	1995
11.	Dr. Krishan Lal, Principal Scientist	2003
12.	Dr. RL Sapra, Principal Scientist, IARI	2002
13.	Dr. Seema Jaggi, Senior Scientist	1995
14.	Dr. Lalmohan Bhar, Senior Scientist	1998
15.	Dr. Amrit Kumar Paul, Senior Scientist	1998
16.	Dr. Tauqueer Ahmad, Senior Scientist	1998
17.	Dr. AR Rao, Senior Scientist	1998
18.	Dr. Ramasubramanian V, Senior Scientist	1999
19.	Dr. Girish Kumar Jha, Senior Scientist (at IARI)	1999
20.	Dr. Cini Varghese, Senior Scientist	2000
21.	Dr. Himadri Ghosh, Senior Scientist	2004
22.	Dr. Prachi Misra Sahoo, Scientist	2002
23.	Dr. Hukum Chandra, Scientist	2003
24.	Sh. Amrender Kumar, Scientist	2003
25.	Md. Wasi Alam, Scientist	2003
26.	Dr. Prawin Arya, Senior Scientist	2003
27.	Dr. Anil Kumar, Senior Scientist	2010
28.	Dr. Sanjeev Panwar, Scientist (SS)	2011
29.	Dr. Ranjit Kumar Paul, Scientist	2011
30.	Dr. Mir Asif Iquebal, Scientist	2011
31.	Dr. BN Mandal, Scientist	2011
32.	Dr. Susheel Kumar Sarkar, Scientist	2011
33.	Dr. N Okendro Singh, Scientist	2011
34.	Dr. Eldho Varghese, Scientist	2011
35.	Dr. (Smt.) Yogita Gharde, Scientist	2012

FACULTY MEMBERS OF P.G. SCHOOL, IARI IN COMPUTER APPLICATION

S. No.	Name	Year of induction
1.	Dr. PK Malhotra, Head & Professor (Computer Application)	1991
2.	Dr. RC Goyal, Principal Scientist	1995
3.	Dr. Sudeep, Senior Scientist	2002
4.	Dr. Alka Arora, Scientist	2001
5.	Smt. Anu Sharma, Scientist	2004
6.	Smt. Shashi Dahiya, Scientist	2001
7.	Md. Samir Farooqi, Scientist	2001
8.	Sh. KK Chaturvedi, Scientist	2002
9.	Sh. SN Islam, Scientist	2004
10.	Sh. SB Lal, Scientist	2004
11.	Smt. Anshu Bharadwaj, Scientist	2004
12.	Smt. Sangeeta Ahuja, Scientist	2002
13.	Smt. Rajni Jain, Senior Scientist (at NCAP)	2007
14.	Sh. Pal Singh, Scientist	2010

FACULTY MEMBERS OF P.G. SCHOOL, IARI IN AGRICULTURAL BIOINFORMATICS

S. No.	Name	Year of induction
1.	Dr. VK Bhatia, Director, IASRI	2010
2.	Dr. Prajneshu, Head, Biometrics and Statistical Modelling & Professor (Bioinformatics)	2010
3.	Dr. KC Bansal, Director, NBPGR	2010
4.	Dr. Rajender Parsad, Head, Design of Experiments & Professor (Agricultural Statistics)	2010
5.	Dr. Anil Rai, Head, Centre of Agricultural Bioinformatics	2010
6.	Dr. Seema Jaggi, Senior Scientist	2010
7.	Dr. AR Rao, Senior Scientist	2010
8.	Dr. Sudeep, Senior Scientist	2010
9.	Sh. SB Lal, Scientist (SS)	2010
10.	Md. Samir Farooqi, Scientist (SS)	2010
11.	Smt. Anu Sharma, Scientist (SS)	2010
12.	Dr. TR Sharma, Principal Scientist, IARI	2010
13.	Dr. T Mahapatra, Principal Scientist, IARI	2010
14.	Dr. Kishore Gaikwad, Senior Scientist, IARI	2010
15.	Dr. RL Sapra, Principal Scientist, IARI	2010
16.	Dr. T Napolean, Senior Scientist, IARI	2010
17.	Dr. PK Singh, Senior Scientist, IARI	2010
18.	Dr. PS Pandey, Senior Scientist, IARI	2010
19.	Dr. KV Bhat, Principal Scientist, NBPGR	2010
20.	Dr. SS Marla, Principal Scientist, NBPGR	2010
21.	Dr. Sunil Arechak, Scientist, NBPGR	2010
22.	Dr. DC Mishra, Scientist	2011
23.	Dr. (Smt.) Sarika, Scientist	2011
24.	Dr. Sanjeev Kumar, Scientist	2011

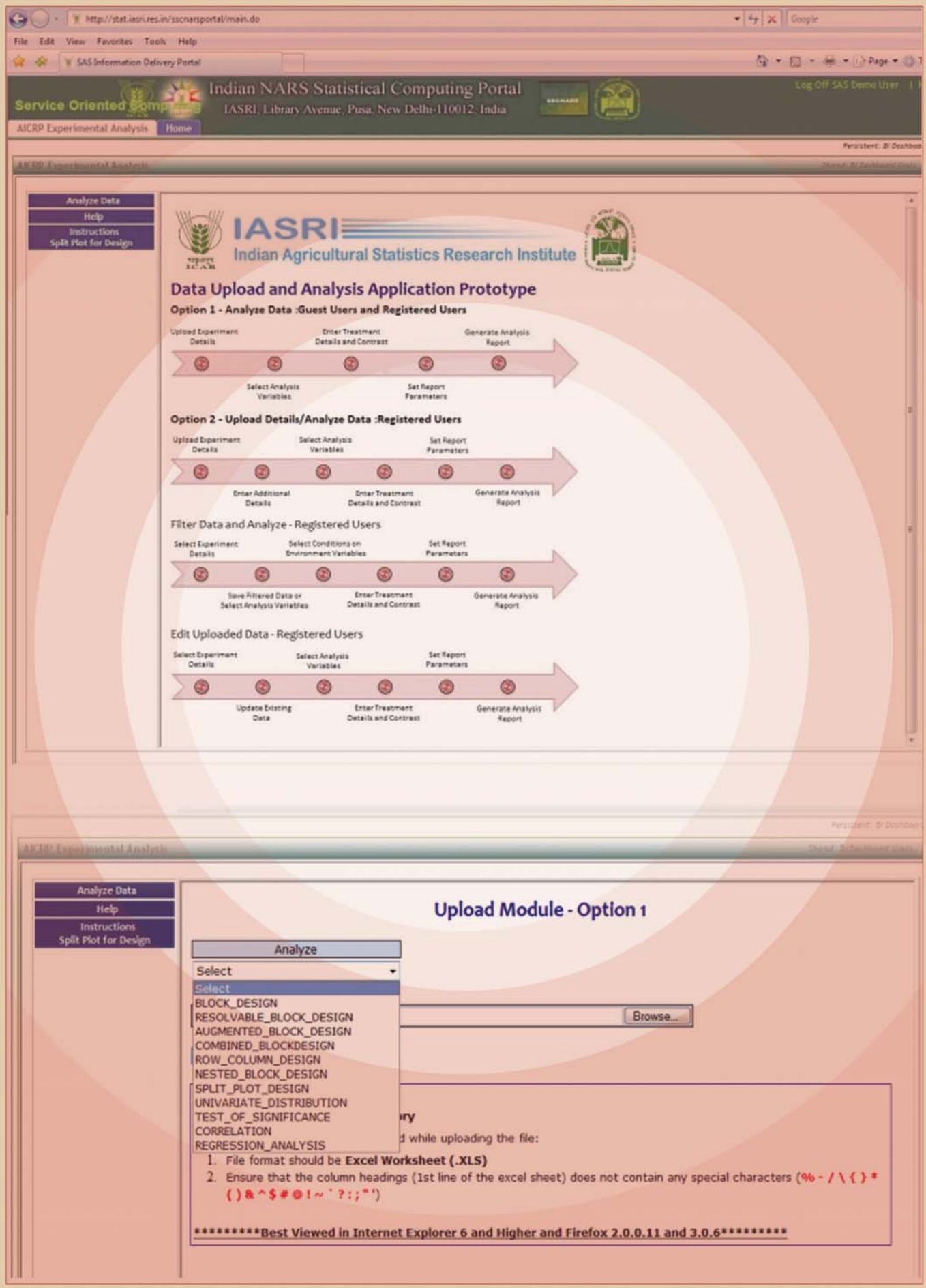
COURSES TAUGHT DURING THE ACADEMIC YEAR 2010–11

Code	Title	Course Instructors
	AGRICULTURAL STATISTICS	
	Trimester – III	
AS-103 / AS-503	Elementary Sampling & Non-Parametric Methods (2+1)	KK Tyagi & Amrender Kumar
AS-563	Statistical Inference (4+1)	Rajender Parsad, LM Bhar & GK Jha
AS-164 / AS-564	Design of Experiments-I (3+1)	Seema Jaggi & VK Gupta
AS-166 / AS-566	Statistical Genetics-I (3+1)	VK Bhatia
AS-608	Advanced Bioinformatics (2+1)	AR Rao & KV Bhat
AS-662	Advanced Designs for Multifactor Experiments (2+1)	Krishan Lal, PK Batra & Rajender Parsad
AS-664	Inferential aspects of Survey Sampling & Analysis of Survey Data (2+1)	UC Sud & Tauqueer Ahmad
AS-667	Forecasting Techniques (1+1)	Chandrahas & Amrender Kumar
AS-299 / AS-691	Seminar (1+0)	Anil Kumar
	COMPUTER APPLICATION	
	Trimester – III	
CA-503	Statistical Computing in Agriculture (1+2)	Samir Farooqi, Amrit Kumar Paul & Anshu Bharadwaj
CA-563	Operating System (2+1)	HO Aggarwal
CA-567	Computer Networks (2+1)	SN Islam & Alka Arora
CA-571	Modelling & Simulation (2+1)	PK Malhotra & Anshu Bharadwaj
CA-299 / CA-691	Seminar (1+0)	Pal Singh

COURSES TAUGHT DURING THE ACADEMIC YEAR 2011–12

Code	Title	Course Instructors
	AGRICULTURAL STATISTICS	
	Trimester – I	
PGS-504	Basic Statistical Methods in Agriculture (2+1)	KK Tyagi, AK Gupta & Anil Kumar
AS-501	Basic Statistical Methods (2+1)	Mir Asif Iquebal & VK Jain
AS-550	Mathematical Methods (4+0)	Cini Varghese & Himadri Ghosh
AS-560	Probability Theory (2+0)	KN Singh
AS-561	Statistical Methods (2+1)	Seema Jaggi & Ranjit Kumar Paul
AS-567	Applied Multivariate Analysis (2+1)	Ranjana Agrawal & AR Rao
AS-568	Econometrics (2+1)	Prawin Arya & GK Jha
AS-569	Planning of Surveys / Experiments (2+1)	UC Sud & DK Sehgal
AS-600	Advanced Design of Experiments (1+1)	Rajender Parsad & Cini Varghese
AS-601	Advanced Sampling Techniques (1+1)	Prachi Misra Sahoo & Hukum Chandra
AS-202 / AS-602	Advanced Statistical Genetics (1+1)	SD Wahi & AK Paul
AS-603	Regression Analysis (1+1)	LM Bhar & N Okendro Singh
AS-604	Linear Models (2+0)	Krishan Lal & VK Gupta
AS-606	Optimization Techniques (1+1)	UC Sud & Prajneshu
AS-299/ AS-691	Seminar (1+0)	BN Mandal
	Trimester – II	
PGS-504	Basic Statistical Methods in Agriculture (2+1)	KK Tyagi, BN Mandal & Amrender Kumar
AS-502	Basic Design of Experiments (2+1)	Anil Kumar, DK Sehgal & Susheel Kumar Sarkar
AS-551	Mathematical Methods in Statistics (4+0)	Cini Varghese, NK Sharma & Prawin Arya
AS-562	Advanced Statistical Methods (2+1)	Seema Jaggi & Ramasubramanian V
AS-565	Sampling Techniques (3+1)	Tauqueer Ahmad & Prachi Misra Sahoo
AS-570	Statistical Modeling (2+1)	Prajneshu & Mir Asif Iquebal
AS-571	Bioinformatics (3+1)	AR Rao, KV Bhat, Rajender Parsad & TR Sharma
AS-572	Statistical Quality Control (2+0)	Wasi Alam
AS-605	Advanced Statistical Inference (1+1)	KN Singh & Anil Rai
AS-607	Stochastic Processes (3+0)	Himadri Ghosh & Sanjeev Kumar
AS-661	Advanced Designs for Single Factor Experiments (2+1)	LM Bhar and VK Gupta
AS-663	Advanced Theory of Sample Surveys (2+1)	Hukum Chandra & Tauqueer Ahmad
AS-299/AS-691	Seminar (1+0)	BN Mandal
	COMPUTER APPLICATION	
	Trimester – I	
CA-111/CA560	Computer Organization and Architecture (3+0)	Shashi Dahiya & HO Aggarwal
CA-502	Introduction to Computer Application (1+1)	Samir Farooqi & PS Pandey
CA-551	Mathematical Foundations in Computer Application (4+0)	NK Sharma & DC Mishra
CA-552	Computer Oriented Numerical Methods (2+1)	HS Sikarwar
CA-561	Principles of Computer Programming (2+1)	Anu Sharma & Sudeep
CA-565	Compiler Construction (2+1)	SB Lal & Soumen Pal
CA-569	Web Technologies & Applications (2+1)	Alka Arora & SN Islam
CA-570	Computer Graphics (2+1)	Pal Singh
CA-575	Artificial Intelligence (2+1)	Sudeep & Rajni Jain
CA-691	Seminar (1+0)	RC Goyal
	Trimester – II	
CA-501	Computer Fundamentals and Programming (3+1)	SN Islam & Pal Singh
CA-562	Object Oriented Analysis and Design (2+1)	Sangeeta Ahuja & Sudeep
CA-564	Data Structures and Algorithms (2+1)	Shashi Dahiya & Soumen Pal
CA-566	Database Management System (2+2)	RC Goyal, Anu Sharma & OP Khanduri
CA-568	Software Engineering (2+0)	Rajni Jain & RC Goyal
CA-572	GIS & Remote Sensing Techniques (2+1)	Prachi Misra Sahoo & Anshu Bharadrwaj
CA-573	Data Warehousing (2+1)	Anil Rai & Samir Farooqi
CA-574	Data Mining & Soft Computing (2+1)	Anshu Bharadwaj, Alka Arora & Rajni Jain
CA-578	Information Security (2+1)	Pal Singh
CA-691	Seminar (1+0)	Anshu Bharadwaj
	BIOINFORMATICS	
	Trimester – I	
BI-501	Molecular Cell Biology (3+0)	P Ananda Kumar, PK Jain & S Barthakur
BI-502	Introduction to Computer Application (1+1)	Samir Farooqi & PS Pandey
BI-503	Mathematical Foundations in Computer Application (4+0)	NK Sharma & DC Mishra
BI-504	Principles of Biotechnology (3+0)	KC Bansal, RC Bhattacharya, Amole Solanki & D Patanayak
BI-505	Principles of Computer Programming (2+1)	Anu Sharma & Sudeep
BI-691	Seminar (1+0)	Anil Rai
	Trimester – II	
BI-506	Database Management System (2+2)	RC Goyal, Anu Sharma & OP Khanduri
BI-507	Bioinformatics (1+1)	TR Sharma, KV Bhat, AR Rao & Rajender Parsad
BI-508	Protein Biosynthesis (3+0)	IM Santha, Suneha Goswami & Archna Sachdev
BI-526	Comparative Genomics (1+1)	KC Bansal, M Grover & Sarika
BI-691	Seminar (1+0)	DC Mishra

Note: Figures in the parentheses indicate the number of credits (Lectures + Practicals)


http://stat.iasri.res.in/sscnarsportal/main.do
File Edit View Favorites Tools Help
SAS Information Delivery Portal
Indian NARS Statistical Computing Portal
IASRI, Library Avenue, Pusa, New Delhi-110012, India
Service Oriented Computing
Log Off SAS Demo User
AICRP Experimental Analysis
Home
Analyze Data
Help
Instructions
Split Plot for Design
IASRI
Indian Agricultural Statistics Research Institute
Data Upload and Analysis Application Prototype
Option 1 - Analyze Data :Guest Users and Registered Users
Upload Experiment Details
Enter Treatment Details and Contrast
Generate Analysis Report
Select Analysis Variables
Set Report Parameters
Option 2 - Upload Details/Analyze Data :Registered Users
Upload Experiment Details
Select Analysis Variables
Set Report Parameters
Enter Additional Details
Enter Treatment Details and Contrast
Generate Analysis Report
Filter Data and Analyze - Registered Users
Select Experiment Details
Select Conditions on Environment Variables
Set Report Parameters
Save Filtered Data or Select Analysis Variables
Enter Treatment Details and Contrast
Generate Analysis Report
Edit Uploaded Data - Registered Users
Select Experiment Details
Select Analysis Variables
Set Report Parameters
Update Existing Data
Enter Treatment Details and Contrast
Generate Analysis Report
Upload Module - Option 1
Analyze
Select
Select
BLOCK_DESIGN
RESOLVABLE_BLOCK_DESIGN
AUGMENTED_BLOCK_DESIGN
COMBINED_BLOCKDESIGN
ROW_COLUMN_DESIGN
NESTED_BLOCK_DESIGN
SPLIT_PLOT_DESIGN
UNIVARIATE_DISTRIBUTION
TEST_OF_SIGNIFICANCE
CORRELATION
REGRESSION_ANALYSIS
Browse...
while uploading the file:
1. File format should be Excel Worksheet (.XLS)
2. Ensure that the column headings (1st line of the excel sheet) does not contain any special characters (% - / \ { } * ( ) & ^ $ # @ ! ~ ` ? : ; " ')
*********Best Viewed in Internet Explorer 6 and Higher and Firefox 2.0.0.11 and 3.0.6*********