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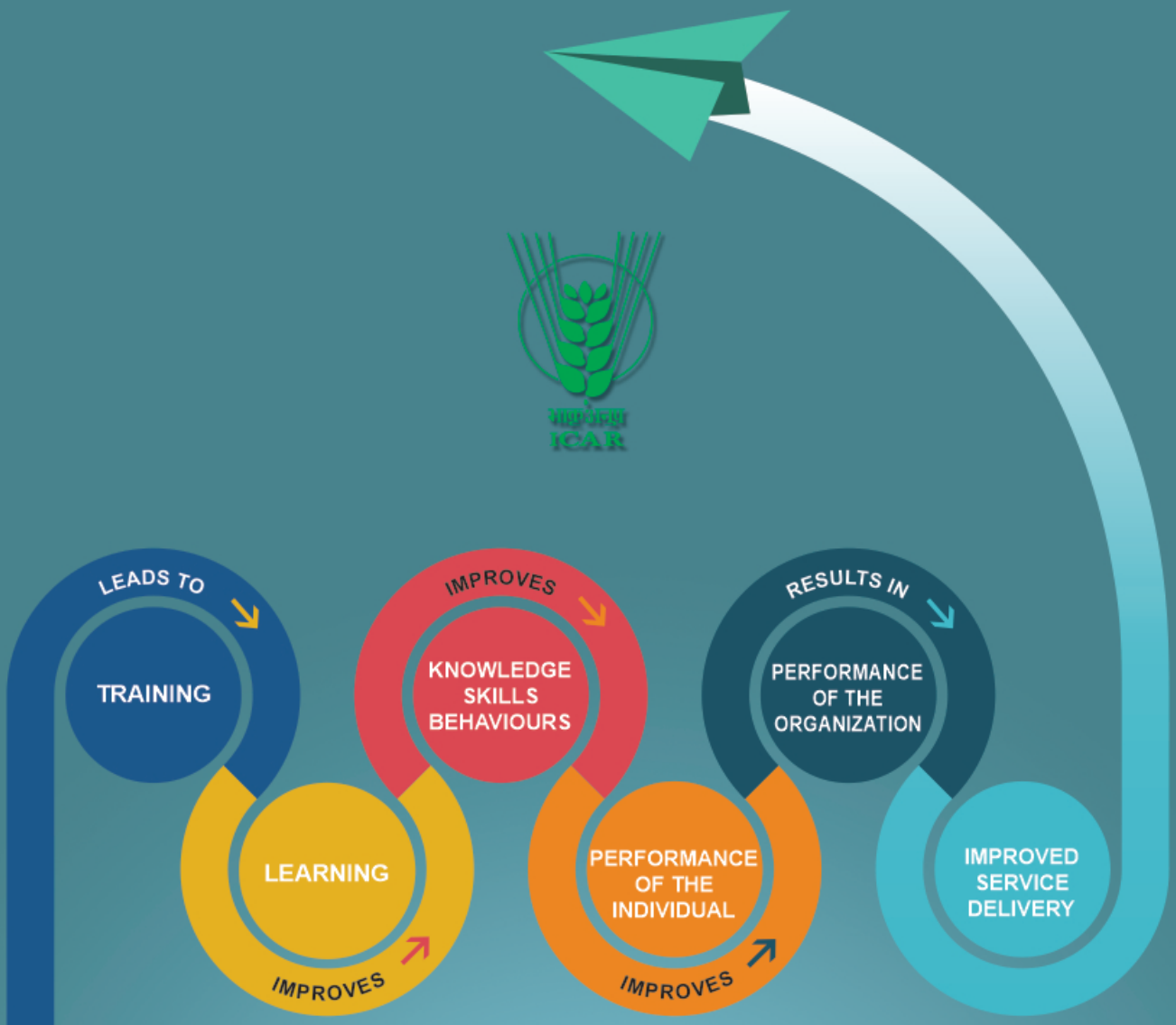

INDIAN COUNCIL OF AGRICULTURAL RESEARCH
Krishi Bhavan, New Delhi 110 001
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New Training Modules Based on Training Need Assessments (2015-20)

Human Resource Management Unit
Indian Council of Agricultural Research
Krishi Bhavan, New Delhi 110 001
www.icar.org.in

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नरेन्द्र सिंह तोमर
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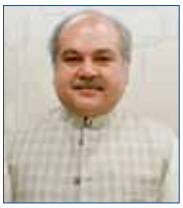

26.03.2021

संदेश

मुझे यह जानकर खुशी है कि भारतीय कृषि अनुसंधान परिषद, नई दिल्ली द्वारा विगत पाँच वर्षों (2015-20) में, प्रशिक्षण आवश्कताओं के मूल्यांकन के आधार पर प्रारम्भिक स्तर पर कार्यरत कार्मिकों (कुशल सहायक स्टाफ़ एव चालक) से लेकर वरिष्ठ अधिकारियों के प्रशिक्षण एवं क्षमता निर्माण के लिए विभिन्न प्रशिक्षण मॉड्यूल्स (Training Modules) को डिजाईन एवं विकसित कर प्रशिक्षण कार्यक्रम आयोजित किये एवं इनका संकलन "New Training Modules Based on Training Need Assessments (2015-2020)" नामक प्रकाशन के रूप में किया है। आयोजित प्रशिक्षण कार्यक्रमों के परिणामस्वरूप सभी वर्गों के कार्मिकों के व्यवहार एवं कार्यप्रणाली में आशातीत वृद्धि दर्ज की है।

परिषद को "New Training Modules Based on Training Need Assessments (2015-2020)" के सफलतापूर्वक प्रकाशन के लिए मेरी ओर से बधाई और शुभकामनाएँ। मुझे उम्मीद है कि यह प्रकाशन भारतीय कृषि अनुसंधान परिषद के कार्मिकों के साथ–साथ भारत सरकार के अन्य मंत्रालयों/विभागों एवं देश के कृषि विश्वविधालयों में प्रशिक्षण और क्षमता निर्माण को और अधिक बढ़ाने के लिए उपयोगी साबित होगा।

(नरेन्द्र सिंह तोमर)

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भारत सरकार
MINISTER OF STATE FOR AGRICULTURE
& FARMERS WELFARE
GOVERNMENT OF INDIA

दिनांक : 23 मार्च, 2021

संदेश

मुझे यह जानकर हार्दिक प्रसन्नता है कि भारतीय कृषि अनुसंधान परिषद, नई दिल्ली द्वारा विगत पाँच वर्षों (2015-20) में, प्रशिक्षण आवश्कताओं को ध्यान में रखते हुए 100 नए प्रशिक्षण मॉड्यूल्स (Training Modules) डिजाईन एवं विकसित कर प्रशिक्षण कार्यक्रम आयोजित किये। इसी क्रम में परिषद "New Training Modules Based on Training Need Assessments (2015-2020)" नामक प्रकाशन का एक संस्करण प्रकाशित कर रहा है। मुझे आशा है कि ये प्रशिक्षण कार्यक्रम निर्बाध रूप से चलेगें तथा इनमें कार्मिकों की संख्या बढ़ने के साथ उनके कामकाज की गुणवत्ता एवं उपयोगिता में निरंतर वृद्धि होगी।

मैं विगत वर्षों के दौरान मानव संसाधन प्रबंधन के क्षेत्र में की गई नई पहल और उपलब्धियों पर भाकृअनुप की सराहना करता हूँ। मुझे आशा है कि यह प्रकाशन "New Training Modules Based on Training Need Assessments (2015-2020)" सम्पूर्ण राष्ट्रीय कृषि अनुसंधान और शिक्षा प्रणाली कार्मिकों के विभिन्न कार्यक्षेत्रों एवं कार्यात्मक समूह के लिये सन्दर्भ प्रकाशन के रूप में उपयोगी होगा जिससे कि वे अपने कैडर को आवश्कताअनुसार प्रशिक्षण दे सकेगें।

शुभकामनाओं सहित।

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सचिव एवं महानिदेशक
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SECRETARY & DIRECTOR GENERAL

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FOREWORD

Training is continuous process. Though there is cost of training for employees, the returns on investment are immense as it moulds the capabilities and attitudes of the employees for quality performance. The Indian Council of Agricultural Research (ICAR) has been making concerted efforts for competency enhancement of all categories of employees since 2014 with the creation of Human Resource Management Unit at ICAR HQs as per National Training Policy-2012 of Government of India.

ICAR has been focusing on Systematic Approach to Training (SAT) to ensure that the employees of all categories are properly equipped with necessary knowledge and skills. The SAT is being implemented through Training Needs Analysis, Design and Development of Training Programmes based on TNA, Implementation of Training Programmes, and Monitoring and Evaluation of Training Programmes. For the first time in ICAR, identification of training need of all categories of employees has been done by ICAR-Institutes during 2015-17 and 253 training need areas comprising 128 for Scientific, 55 for Technical, 39 for Administrative & Finance personnel and 31 for Skilled Support Staff have been identified. The competent ICAR-Institutes designed and developed 100 training modules based on assessment of training needs and organized training programmes. Based on the feedbacks of the participants and the domain specific experts, these Training Modules have been modified, compiled and documented as "New Training Modules based on Training Need Assessments (2015-20)" for publication by ICAR. The publication would serve as reference document for various categories, sectoral and functional group of employees in ICAR as well as the entire National Agricultural Research and Education System (NARES) including Central Agricultural Universities and State Agricultural Universities. The document would also be useful for Central/ State Agriculture Departments/Ministries to train their cadre as per requirements.

The valuable contributions of Course/Programme Directors/Coordinators, Directors and HRD Nodal Officers of ICAR-Institutes/HQs for designing, developing and organizing training programmes based on TNA in a span of five years is highly appreciable. I also acknowledge the sincere and praiseworthy efforts of Dr. A.K. Vyas, Assistant Director General (HRM) & Training Manager, ICAR and his team of HRM Unit for effective coordination and compilation of such a useful publication.

Dated the 22nd March, 2021
New Delhi

(T. MOHAPATRA)

PREFACE

Training and Capacity Building is considered to be the second most important activity of Human Resource Management in an Organization, be in public or private, after recruitment of a right person. The right training at right stage makes employees more efficient and productive and helps in achieving the Organizational Vision, Mission and Goals within a timeline. Training imparts required competencies (knowledge, skills and attitude/behaviour) to the employees, which facilitate them to perform better in their present and future jobs/roles as when the persons join the Govt. service, they are raw and not familiar with the relevant Rules, Regulations, Norms, Acts, Procedures, Practices, etc. to be followed. Therefore, relevant training improves the overall organizational performance which results in improved service delivery.

With the advent of National Training Policy - 2012 of GoI, Indian Council of Agricultural Research (ICAR) has been emphasizing on Training and Capacity Building of more than 17,100 employees of all categories, viz. Scientific, Technical including Drivers, Administrative including Finance and Stenographer Grades, and Skilled Support Staff, since 2014. A designated HRM Unit was created at ICAR Headquarters in September, 2014 for overall coordination, implementation, monitoring and management of training in ICAR. Subsequently, Institutionalized System of Training was developed and "*ICAR HRM Policy: Training and Capacity Building*" was formulated and implemented with focus on the tenet of 'competency-based training for all'. For the first time in ICAR, Systematic Approach to Training was introduced through Training Needs Analysis (TNA); Design, Development, Implementation, Evaluation, and Impact Assessment of Training.

During the initial phase of Policy implementation (2014-2017), there was a great challenge to cater the need of the organization to train so large number of employees scattered over 114 Institutes/ Headquarters across the entire country belonging to four categories with diverse sectoral and functional groups, roles and responsibilities. It was thought appropriate to adopt Bottom-Up approach to meet the training needs of ICAR employees. For the first time, identification of training needs of all categories of employees was done by all ICAR-Institutes/HQs during 2015-16 and 2016-17 and identified 253 training need areas for all categories of employees (128, 55, 39 and 31 training areas for Scientific, Technical, Administrative staff including Finance, and Skilled Support Staff, respectively) to address specific identified requirements through appropriate training programmes to develop/enhance competencies.

First time based on TNA, leading ICAR-Institutes have designed, developed and organized large number of new specialized training programmes for Scientific, Technical, Administrative Staff; HRD Nodal Officers; Vigilance Officers; Stenographer Grades; Farm Managers; Guest House Incharges/Caretakers; Regular Drivers; and Skilled Support Staff with field/exposure visit. New specialized programmes have also been designed and organized for staff dealing with Security, Court Cases, Works/Estate/Building Maintenance and Assets Management. Ever first Trainers Development Programme for developing Masters' Trainers in ICAR has been designed and organized.

Hundred new Training Modules designed, developed and organized based on TNA have been documented after suitable modifications based on the feedback of the participants as well as domain-specific experts. This publication is unique, as there is no publication in the country with specialized Training Modules for all four categories of employees i.e. Scientific, Technical, Administrative and Skilled Support Staff serving agricultural Organization, that too 100 new ones. This would serve as reference/ready reckoner for various sectoral and functional group of employees in ICAR, Central Agricultural Universities (CAUs), State Agricultural Universities (SAUs), the entire National Agricultural Research and Education System (NARES) as a whole to enhance the competencies of the employees and performance of the Organization. Even this may be useful for Central/State Agriculture Department/Ministries to train their cadre as per requirement.

The publication "*New Training Modules Based on Training Need Assessments (2015-2020)*" has been ascribed to valuable guidance and support received from Dr S Ayyappan, Former Secretary, DARE & DG, ICAR in the initial phase; and later from Dr T Mohapatra, Secretary, DARE & DG, ICAR. and Shri C Roul, Former Special Secretary, DARE & Secretary, ICAR, Shri Sushil Kumar, Former Addl Secretary, DARE & Secretary, ICAR, Shri Sanjay Singh, Special Secretary, DARE & Secretary, ICAR and Shri B Pradhan, Special Secretary & Financial Advisor (DARE/ICAR) in the effective phase of Policy implementation. It is noteworthy to mention the support and contribution of all Deputy Director Generals; Directors of ICAR-Institutes; HRD Nodal Officers of ICAR, Course Directors and Course Coordinators without which design, development and organization of new training programmes based on TNA was not possible.

I would like to particularly mention the valuable contributions made by Dr N K Jain, Principal Scientist (HRM Unit) & HRD Nodal Officer, ICAR HQs; entire IFD team and Shri Kanhaiya Chaudhary, Former Special Director (Admn). The necessary support was also provided by Ms Anjali Sharma, SO; Shri Ajay Kohli, PA; Shri Sanjay Kumar, Assistant and Ms Abhilasha Saini, Assistant from HRM Unit, ICAR HQs from time to time.

I hope this publication "*New Training Modules Based on Training Need Assessments (2015-2020)*" will be useful for further scaling up the Training and Capacity Building of employees of ICAR, CAUs, SAUs as well as of other Central/State Govt Ministries/Departments.

Dated the 10th March, 2021

(A K Vyas)
Asstt Director General (HRM) &
Training Manager, ICAR
KAB - II, Pusa, New Delhi

ACKNOWLEDGEMENT

The publication "*New Training Modules Based on Training Need Assessments (2015-2020)*" could be actualized due to valuable guidance and support of Dr S Ayyappan, Former Secretary, DARE & DG, ICAR in the initial phase; and later from Dr T Mohapatra, Secretary, DARE & DG, ICAR; Shri C Roul, Former Special Secretary, DARE & Secretary, ICAR; Shri Sushil Kumar, Former Addl. Secretary, DARE & Secretary, ICAR, Shri Sanjay Singh, Special Secretary, DARE & Secretary, ICAR and Shri B Pradhan, Special Secretary & Financial Advisor (DARE/ICAR) in the effective phase of Policy implementation.

The support and cooperation of all Deputy Director Generals, Assistant Director Generals and Directors of ICAR-Institutes/HQs are commendable in design, development and organization of new specialized training programmes based on TNA for different categories of employees of ICAR. The efforts of HRD Nodal Officers, Course Directors and Course Coordinators and their teams associated with this significant exercise are sincerely acknowledged for effective design, development and organization of specialized training programmes for employees of ICAR, CAUs and SAUs and facilitating compilation of New Training Modules, first of its kind in the entire NARES. The contribution of Shri Kanhaiya Chaudhary, Former Special Director (Admn) is also thankfully acknowledged.

Sincere efforts of Dr N K Jain, Principal Scientist (HRM) & HRD Nodal Officer, ICAR HQs is noteworthy and duly acknowledged for assisting in overall coordination, compilation and editing of the compendium, and in bringing out this publication. The necessary support provided by Ms Anjali Sharma, SO; Shri Ajay Kohli, PA; Shri Sanjay Kumar, Assistant and Ms Abhilasha Saini, Assistant from HRM Unit, ICAR HQs from time to time are also duly recognized. The contribution of DKMA, New Delhi is also duly acknowledged for printing of this document.

ADG (HRM) &
Training Manager, ICAR

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1. Introduction

Indian Council of Agricultural Research (ICAR) is an autonomous organization under the Department of Agricultural Research and Education (DARE), Ministry of Agriculture and Farmers Welfare, Govt of India with the Headquarters at New Delhi. It is a scientific Research & Development organization involved in scientific innovations and technology development in the field of agriculture and allied sciences through its 114 Institutes spread over the entire country. ICAR is served by about 17,100 employees under four different categories namely Scientific, Technical, Administrative including Finance and Skilled Support Staff. Developing competency of each employee of different category as per National Training Policy - 2012 of GoI was a great challenge for an organization like ICAR. This needed concerted and focused initiatives to enhance the efficiency and effectiveness of each employee through various training and capacity building programmes.

For the first time, *"ICAR HRM Policy: Training and Capacity Building"* has been formulated in sync with National Training Policy-2012 of Government of India and approved for implementation for all categories of ICAR employees (*https://hrm.icar.gov.in/data/ICAR-HRM-policy-2018.pdf*). This policy focuses on the tenet of 'competency-based training for all' which means that all cadres should get due emphasis for training and capacity building. It encompasses model training schemes for all categories of staff. The Policy envisages for transforming the employees of ICAR by developing strategic human resource management system, which shall look at the individual as a vital resource to be valued, motivated, developed and enabled to achieve the overall Organization's Mission and Objectives.

Training is a very important activity for an organization, be it private or public and ICAR is not an exceptional. Organizations have grown to understand this over the past few decades and have started giving due attention to it, along with the required budgets. It is fruitful to both the employer and the employees of an organization. An employee becomes more efficient and productive if he/she is trained well through proper training and capacity building programmes. With the advent of globalization, technological and information revolution, it has become imperative for the Organizations to have a well-trained staff in order to achieve the Organizational Vision, Mission and Goals. Training imparts required competencies (knowledge, skills and attitude/ behaviour) to the employees, equipped with which, they can perform better in their present and future jobs/roles. This improves the overall organizational performance which results in improved service delivery.

The Govt of India perceived the importance of training since beginning and created a separate Ministry/Department (DoPT). Later, the Indian Council of Agricultural Research has realized to lay more emphasis and greater focus on Training and Capacity Building of its employees since 2014. Keeping in view of the importance of training and gaps in training of the employees, ICAR has taken up concerted steps for training and capacity building of all four categories of its employees (Scientific, Technical including Drivers, Administrative including Finance and Stenographer Grades, and Skilled Support Staff).

It is important to know the training needs of employees which is the gap between the actual and desired levels of performance that can be bridged through training. Training Needs Analysis (TNA) is the first stage of the Systematic Approach to Training (SAT). Training needs analysis is a stage, where the requirements of training are identified. As described in the basic tenets above, any training should be imparted to address specific identified requirements (demand-based).

Based on training need identification, leading ICAR-Institutes have designed, developed and organized specialized training and capacity building programmes for all the categories of employees. Such new Training Modules designed and developed based on TNA have been modified based on the feedback of the participants as well as reviewed by the domain-specific experts to make it more trainees' friendly and meaningful to better serve the purpose of the Organization. The *"Training Modules Based on Training Need Assessments (2015-20)"* would be useful for various sectoral and functional group of employees in ICAR, Central Agricultural Universities (CAUs), State Agricultural Universities (SAUs), the entire National Agricultural Research and Education System (NARES) as a whole to enhance the competence of the employees and performance of the Organization. Even this may be useful for Central/State Agriculture Departments to train their cadre as per requirement.

2. Systematic Approach to Training (SAT)

Government employees are doing their jobs anyway, using the wisdom they have acquired mostly from their predecessors, from their colleagues, from their experiences and mistakes-whether there is a formal training or not. The problem is that the learning acquired through such unstructured means may be outdated, insufficient and ineffective. In the absence of a structured system of training, several chaotic and inharmonious work practices may get into the system and get institutionalized.

The Systematic Approach to Training (SAT) is only the way to answer such type of fundamental questions. SAT helps to achieve the objectives of training and get better results as training activities are carried out through a 'planned process', or a 'group of planned processes' rather relying on informal and unstructured learning of individuals. Therefore, there is need to adopt such systematic approach for making the training functions useful for the Organization.

SAT is an orderly and logical approach for an end-to-end training functions and ensures that the employees are properly equipped with necessary knowledge, skills and behaviours to discharge their duties successfully. For implementation of SAT, Institutionalised System for Training & Capacity Building has been created to plan, monitor and implement the training functions in the ICAR-Institutes/HQs.The SAT is implemented through the following four stages:

1. Training Needs Assessment/Analysis
2. Design and Development of Training Programmes
3. Implementation of Training Programmes
4. Monitoring and Evaluation of Training Programmes

3. Training Needs Assessment (TNA)

Training needs analysis/assessment is a stage, where the requirements of training are identified. Every training should be imparted to address specific identified requirements (demand-based). Therefore, the very first stage should be a systematic identification of training needs, after which, further details have to be worked out. Analysis is a study carried out to figure what is required to be done. The analysis phase is the building block of a training programme. The basis for who must be trained and in what areas one must be trained is formed in this phase.

Literally, a training need may be defined as the gap between the actual and desired levels of performance that can be bridged through training. TNA is considered to be the most crucial stage as the further stage depends upon it. If this stage is well done, it can be considered that the training itself is half done. This is because the trainees can easily connect themselves with the actual training, when it is given to them, as the training actually addresses their training requirements.

For the first time in ICAR, identification of training need of all categories of employees has been done by all the Institutes during 2015-16 and 2016-17. ICAR-Institutes have identified 253 training need areas for all categories of employees (128, 55, 39 and 31 training areas for Scientific, Technical, Administrative staff including Finance, and Skilled Support Staff, respectively).

First time in ICAR, all ICAR-Institutes/HQs have been developing Annual Training Programme (ATP) based on TNA for all categories of employees since 2016-17. Based on ATP developed, the employees are being deputed for various kinds of training programmes either within the ICAR or outside the system.

4. Design and Development of Training Programmes

It is important to ensure that suitable training modules are designed and developed to address the training needs of the employees. The content should be properly developed to impart necessary knowledge, skills and behaviours to the trainees. The usefulness of this stage is to ensure that the training is well designed keeping the needs in consideration, in a structured manner and that all important aspects of training delivery are thought through.

It was observed that suitable training programmes for Technical Staff; Stenographer Grades; Regular Drivers; Farm Manager; Guest Incharges/Caretakers; Administrative/Technical staff dealing with Court Cases, Security, Repair and Maintenance; Master Trainers; SSS, etc. were lacking in the system as it was always emphasised to train the Scientists being a scientific R&D Organisation. Based on the recognised training needs, 17 leading ICAR-Institutes including ICAR-NAARM, Hyderabad have been identified and 04 new EDPs for Senior Officer; 12 specialized training programmes for Scientific staff; 03 training programmes each for Vigilance Officers, ITMU/ZTMU Incharges, and PME Cell Incharges; 08 programmes for HRD Nodal Officers; 77 specialized new training programmes for Technical staff; 06 programmes for Farm Managers/Technical staff dealing with farm; 11 new training programme each for Regular

Drivers and Stenographer grade staff; 17 for Administrative staff; 01 new programme each for Developing Master Trainers, CJSC members, Administrative/technical staff dealing with Court Cases, Security, Repair and Maintenance; 03 for Technical staff associated with Library work; and 311 new programmes for SSS were designed, developed and organized during 2016-20. Besides, 02 new training programmes for Guest Incharges/Caretakers were also designed, developed and organized by ICAR-NAARM, Hyderabad in collaboration with Institute of Hotel Management, Catering Technology and Applied Nutrition (IHMCT & AN), Hyderabad during 2018-20.

Based on training need identification, ICAR-Institutes have designed, developed and organized new specialized training and capacity building programmes for all the categories of employees. Such New Training Modules have been elaborated here under.

4.1

SCIENTIFIC STAFF

Scientific Staff

Programme: 1

1. **Title** : **Advanced Remote Sensing and GIS Applications in Integrated Land Resource Management**
2. **Organizing Institute** : ICAR-National Bureau of Soil Survey and Land Use Planning, Nagpur
3. **Objective(s)** :
   - To sensitize and orient the participants in the fields of advance remote sensing and GIS in land resource management
   - To enable the participants to acquire the knowledge on the latest technologies of remote sensing, GIS and GPS in land resource database management to use in their research/ teaching
   - To develop expertise in the field of remote sensing and GIS applications in land resource management to cater the need of ICAR.
4. **Duration** : 02 weeks
5. **Category of employees** : Scientist
6. **Course content (day-wise theory and practical course content):**

Days	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Land resource inventory for land use planning
	Field visit	Visit to different Divisions in the Institute
2	I	Geomorphological processes and evolution of landforms
	II	Soil formation factors & Pedo-genesis processes
	III	Soil resource mapping and techniques
	IV	Application of Cartographic principles and techniques in mapping
3	I	Remote sensing - Principles and Concepts
	II	High resolution remote sensing data and their characteristics
	III	Trends in land resource inventory, mapping and monitoring
	IV	Familiarization of different satellite data product
4	I	RS application in soil resource mapping
	II	RS applications in large scale mapping
	III	Land resource inventory at block level
	IV	Visual Image interpretation

Days	Session	Topic/ Activity
5	I	GIS and GPS - Principles and applications
	II	Soil- landscape relationship
	III	Concepts of digital soil mapping
	IV	Image analysis and GIS software's and applications
6	Field visit	Visit for ground truth data collection
7	I	Soil resource data interpretation
	II	Techniques in land evaluation for land use planning
	III	Principles of digital image processing
	IV	*Practical*: Digital Image processing
8	Field visit	Visit to Regional Remote Sensing Centre (RRSC), Nagpur
	II	Geo-referencing and digitization in GIS
9	I	Applications of hyperspectral remote sensing in soils
	II	Design of spatial database in GIS
	III	RS and GIS applications in LULC analysis
	IV	Geo-referencing and digitization in GIS
10	I	Application of geostatistics in spatial data analysis
	II	Remote sensing and land use planning
	III	Assessment of runoff water potential using geospatial technique
	IV	*Practical*: Spatial database generation in GIS
11	I	Trends in land use planning- Issues and challenges
	II	Application of SOTER in soil resource management
	III	Modern concepts in land evaluation
	IV	Project work
12	I	Development of soil information system and geoportal
	II	Submission of brief report on training programme
	III	Feedback
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercise, discussions on actual problems faced, interaction, Project work and Field/Facility visits.

8. Programme Designed, Developed and Organized By:

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Course Director : Dr. G. P. Obi Reddy, Principal Scientist, RSA Division
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Programme: 2

1. **Title** : **Advances in Simulation Modelling and Climate Change Research Towards Knowledge Based Agriculture**
2. **Organizing Institute** : ICAR-Indian Agricultural Research Institute, New Delhi
3. **Objective(s)** :

   To impart knowledge on

   - Advances in climate change research and climate change impacts on agriculture
   - Basics of processes involved in crop simulation modelling
   - Hands-on training on major simulation models
   - Application of simulation models in climate change research for impact assessment, adaptation and mitigation
4. **Venue** : Centre for Environment Sciences and Climate Resilient Agriculture, IARI, New Delhi
5. **Duration** : 03 weeks
6. **Category of employees** : Scientist
7. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Initial know-how survey of trainees and Overview of the programme
	II	Introduction to system, model & simulation modelling and climate change
	III	Climate change and agriculture: Research & facilities
	IV	Modelling plant growth, development and yield-basics
2	I	Modelling soil nitrogen & carbon balance
	II	Modelling water balance
	III	Modelling methane, carbon-di-oxide & nitrous oxide emission
	IV	Crop growth parameterization
	V	Modelling crop-pest interactions

Day	Session	Topic/ Activity
3	I	Data requirement for running a simulation model, data collection and minimum datasets
	II	Modelling crop-disease interactions and forecasting
	III	Climate change and simulation models, recent concepts and approaches, crop-environment interactions
	IV	Calibration validation-basics
	V	Soil sampling and analysis for model input parameters
4	I	*Practical:* Introduction to InfoCrop v2.1 and Loading InfoCrop v2.1 into laptops
	II	*Practical:* InfoCrop crop modules explanation
	III	*Practical:* Hands on running the experiment
	IV	*Practical:* Hands on Weather conversion
	V	Special lecture on soft skills
5	I	*Practical:* Hands on adding soil, weather and variety
	II	*Practical:* Running simulations (exercise 1, management)
	III	*Practical:* Simulation data details, experiments, etc.
	IV	*Practical:* Work with your data
	V	Sensitivity analysis (InfoCrop): Theory and practice
6	I	Calibration and validation (test exercise)
	II	*Practical:* Work with your data-InfoCrop (preparing weather file)
	III	*Practical:* Calibration and validation (test exercise)
	IV	*Practical:* Calibration and validation (test exercise)
	V	Work with your data-InfoCrop
7	Field visit	Visit to Climate Change Research facilities at IARI
8	I	InfoCrop GHG emission details
	II	Use InfoCrop pest module
	III	*Practical:* Work with your data-InfoCrop
	IV	*Practical:* Work with your data-InfoCrop
	V	*Practical:* Work with your data-InfoCrop
9	I	Introduction to DSSAT model
	II	DSSAT model (Basics)
	III	*Practical:* Hands on DSSAT model
	IV	*Practical:* Hands on DSSAT model
	V	*Practical:* Hands on DSSAT model

Day	Session	Topic/ Activity
10	I	DSSAT (data requirement)
	II	Different modules (DSSAT)
	III	*Practical:* Work with your data-DSSAT
	IV	*Practical:* Work with your data-DSSAT
	V	*Practical:* Work with your data-DSSAT
11	I	Hydrological models-basics
	II	Hydrological models-basics
	III	Climate change scenarios and concepts
	IV	*Practical:* Climate change scenarios data use
	V	*Practical:* Climate change scenarios data use
12	I	Climatic risk analysis using simulation tools
	II	Simulating climate change impacts, adaptation gains and vulnerability
	III	*Practical:* Simulating climate change impacts, adaptation gains and vulnerability
	IV	*Practical:* Simulating climate change impacts, adaptation gains and vulnerability
	V	*Practical:* Simulating climate change impacts, adaptation gains and vulnerability
13	I	Economics modelling
	II	Economics modelling
	III	Hyer-spectral technique for monitoring crop growth
	IV	Disease forecasting using models
	V	Carbon sequestration in agricultural soils
14	Exposure visit	Visit to nearby places of importance
15	I	Introduction to APSIM model
	II	APSIM model (Basics)
	III	*Practical:* Hands on APSIM model
	IV	*Practical:* Hands on APSIM model
	V	*Practical:* Hands on APSIM model
16	I	APSIM (data requirement)
	II	Different modules (APSIM)
	III	*Practical:* Work with your data-APSIM
	IV	*Practical:* Work with your data-APSIM
	V	*Practical:* Work with your data-APSIM

Day	Session	Topic/ Activity
17	I	Monitoring crop residue burning -techniques
	II	Yield forecast techniques using simulation models and RS
	III	Socio-economic issues in adaptation to climate change
	IV	GHG mitigation though microbial intervention
	V	Adaptation strategies for climate change
18	I	Climate analogues
	II	RS and Crop model application in Crop Insurance
	III	Phenomics theory and facility
	IV	Advances in climate change research: Modelling and practice
	V	Special lecture: Soft skills
19	I	Recent advances and approaches in modelling
	II	Presentation by the participants in their specialized area/ expertise
	III	Presentation by the participants in their specialized area/ expertise
	IV	Presentation by the participants in their specialized area/ expertise
	V	Presentation by the participants in their specialized area/ expertise
20	I	Model inter- comparison, Model integration, advantages & limitations of simulation models
	II	Climate smart agriculture and climate resilient villages
	III	Final survey, feedback
	Valedictory	Valedictory Programme

8. Pedagogy : Training programme consisted of lectures, practical exercise, demonstrations, discussions, interaction, participants' presentation and Field/Laboratory/Facility visits.

9. Programme Designed, Developed and Organized By:

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Programme: 3

1. **Title** : **Genomics-Assisted Breeding for Crop Improvement**
2. **Organizing Institute** : ICAR-Indian Agricultural Research Institute, New Delhi
3. **Objective(s)** :
   - To provide information on basic concepts, rational strategies and applied aspects of research that can effectively be utilized in developing crop varieties using genomics-assisted breeding
   - To provide hands-on experience in undertaking genomics-assisted breeding programme
4. **Venue** : Division of Genetics, IARI, New Delhi
5. **Duration** : 03 weeks
6. **Category of employees** : Scientist
7. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Genome sequence and application in plant breeding
	Field visit	Visit to phytotron facility
	Field visit	Visit to phenomics facility
2	I	Planning experiments, data collection and curation
	II	Approaches for mapping QTLs in plants
	III-IV	*Practical*: Hands on linkage mapping
3	I	High throughput genotyping
	II	Basics on marker assisted backcross breeding
	Field visit	Visit to high throughput genotyping facility
4	I	Diversity analyses and phylogenetic relationships
	II-III	Genomic tools in protecting germplasm and varieties
	IV	Genomics in germplasm management
5	I	Mapping populations - basic concepts and development
	II	Softwares for analysing data from plant breeding experiments
	III-IV	Softwares for phylogenetic and diversity analysis
6	I	Genomics of Magnaporthe and its application in rice improvement
	II	Genomic selection in plant breeding
	III-IV	*Practical*: Hands on - GWAS and Genomic Selection

Day	Session	Topic/ Activity
7	I	Genomics in pre-breeding
	II	Molecular markers and its application in crop improvement
	III	Soft skills in management of human resources
	IV	Next generation gene/ QTL identification strategies
8	I	Marker-assisted selection in rice: biotic stress
	II	Marker-assisted selection in rice: abiotic stress & nutritional quality
	III-IV	Genomics-assisted breeding in rice – concept and practicals
9	I	Marker-assisted selection in wheat: biotic stress
	II	Marker-assisted recurrent selection in wheat improvement
	III-IV	Genomics-assisted breeding in wheat – concept and practicals
10	I	Bioinformatics in crop improvement
	II	Marker-assisted selection in maize: specialty traits
	III-IV	Genomics-assisted breeding in maize – concept and practicals
11	I	Application of DH technology in MAS
	II	Genomics assisted breeding – A seed industry perspective
	Field visit	Visit to bioinformatics facility
12	I	Evolving concepts in Plant Breeding – From Mendel to molecular era
	II	Genomics in chickpea improvement
	III-IV	Genomics-assisted breeding in chickpea – concept and practicals
13	I	Marker-assisted selection in mustard: quality improvement
	II	Marker-assisted selection in foxtail millet: abiotic stress
	III-IV	Genomics-assisted breeding in Indian mustard – concept and practicals
14	I	Beyond genome editing: Base editors and their role in crop improvement
	II	Marker-assisted selection in wheat: abiotic stress & nutritional quality
	III	Marker-assisted selection in mustard: biotic stress
	IV	Transcriptomics and its application in crops
15	I	Transgenics in crop improvement – way forward
	II	Marker-assisted selection in maize: nutritional quality
	III	Genomics-assisted breeding in soybean – concept and practicals
	IV	Epigenomics and its role in crop improvement
16	I	Markers in maintenance seed purity
	II	Phenomics in plant breeding
	III	Trainees' feedback
	Valedictory	Valedictory Programme

8. Pedagogy : Training programme consisted of lectures, practical exercise, demonstrations, discussions and Field/ Laboratory/Facility visits.

9. Programme Designed, Developed and Organized By:

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Course Director	:	Dr. Ashok K. Singh, Head, Division of Genetics Email: director@iari.res.in
Associate Course Director(s)	:	Dr. Firoz Hossain, Senior Scientist Dr. Gopala Krishnan S, Principal Scientist

Programme: 4

1. **Title** : **Management of Plant Genetic Resources**
2. **Organizing Institute** : ICAR-National Bureau of Plant Genetic Resources, New Delhi
3. **Objective(s)** :
   - To create awareness on the importance of PGR
   - To provide technical knowhow in the context of current national and international regimes of genetic resources management
4. **Duration** : 02 weeks
5. **Category of employees** : Scientist
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topics/Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Evaluation of participants for impact assessment
	II	Role of ICAR-NBPGR in PGR management
	III	Policy issues in PGR management
	IV	NBPGR documentary and visit to NBPGR Museum and Gene bank
2	I	Centers of origin and diversity of crop plants – Importance in PGR management
	II	Germplasm exploration and collecting : Principles and practices
	III	Application of GIS tools in PGR management
	IV	*Practical* :Visit to National Herbarium of Cultivated Plants (NHCP) and preparation of herbarium specimens
3	I	Protection of farmers' and community rights on indigenous genetic resources
	II	Introduction and exchange of plant genetic resources
	III-IV	*Practical*: PGR Informatics
4	I	Characterization and Evaluation of PGR
	II	Pre-breeding and wide hybridization – Role of PGR
	III-IV	*Practical:* Core Development
5	Exposure visit	*Practical:* Field characterization and data management using wheat as a case study.
6	Exposure visit	Visit to Herbal Garden

Day	Session	Topics/Activity
7	I	Gene bank management for *ex situ* conservation of germplasm
	II	Management of genetic resources of horticultural crops
	III-IV	*Practical :* Procedures for long term conservation of orthodox seeds
8	I	National plant quarantine system
	II	PGR for management of insect pest and insect transmitted diseases
	III-IV	*Practical:* Plant Quarantine processing
9	I	Methods, tissues and species requiring *in vitro* conservation
	II	Conservation of non-orthodox seeded germplasm using cryopreservation
	III	*Practical* : *In vitro* conservation and cryopreservation
10	I	Safe movement of transgenic material: Procedures and challenges
	II	Molecular characterization of PGR
	III-IV	*Practical :* Molecular techniques for evaluation and characterization of PGR
11	I	IPR in PGR management
	II	Digitalization of PGR management
	IV	*Practical :* Filling online application for germplasm registration, variety registration
12	I	Management of crop wild relatives
	II	Germplasm utilization for achieving SDGs
	III	Interactive session
13	Exposure visit	Visit to institutes in Delhi and surrounding area
14	I	Presentation by Participants
	II	Evaluation of participants for impact assessment and Feedback
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercise, demonstrations, discussions, interaction, participants' personation and Field/Laboratory/Facility/ Museum/Gene Bank visits.

8. Programme Designed, Developed and Organized By:

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Course Co-Convener(s) : Dr. Sandeep Kumar, Senior Scientist
Dr. S Rajkumar, Senior Scientist

Programme: 5

1. **Title** : **Contemporary Approaches for Management of Plant Genetic Resources**
2. **Organizing Institute** : ICAR-National Bureau of Plant Genetic Resources, New Delhi
3. **Objective(s)** :
   - To train young plant genetic resource professionals and gene bank curators about standard operating procedure on gene bank operation
   - To understand the utilization and linkage to plant breeders, documentation and management of data
   - Exposure to national and international policy on access and exchange of plant genetic resources
4. **Duration** : 03 weeks
5. **Category of employees** : Scientist
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topics/Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	PGR management in India
	II	Evaluation of participants for impact assessment
	III	NBPGR documentary and visit to NBPGR Museum and Gene bank
2	I	Origin and diversity of crop plants
	II	*Practical*: Methods in germplasm exploration and collecting
	III	*Practical:* Herbarium – Importance and methods
3	I	GIS tools in germplasm collecting and mapping
	II	*Practical:* Hands on session for DIVA-GIS and other applications for GIS
4	I	Collecting and conservation of crop wild relatives
	II	Management of gene bank for *ex situ* conservation of germplasm
	III	*Practical:* Methods for monitoring seed germination and storability for germplasm conservation
5	I	Restoration of degraded ecosystems
	II	*Practical:* Techniques for storage of orthodox seed in LTS
6	Exposure visit	Visit to Biodiversity Park

Day	Session	Topics/Activity
7	I	*In situ* conservation
	II	Cryopreservation as an approach to conserve non-orthodox seeds
	III	*Practical:* Procedures for cryopreservation of seeds, pollen and dormant buds
8	I	Management of genetic resources of horticultural crops
	II	*In vitro* conservation and cryopreservation of clonally propagated crops
	III	*Practical: In vitro* conservation and cryopreservation of clonally propagated crops
9	I	Endophytic microbial issues during *in vitro* conservation
	II	*Practical:* Endophytic microbial issues during *in vitro* conservation
10	I	Principles and practices of plant germplasm characterization and evaluation
	II	*Practical:* Methods of data recording for characterization and evaluation of field crops
11	I	Development of core collection
	II	*Practical:* Softwares for core development
12	I	National plant quarantine system
	II	*Practical:* Plant quarantine processing (pathology and virology
	III	*Practical:* Plant quarantine processing (entomology and nematology)
13	Exposure visit	Visit to institutes in and around Delhi
14	I	DNA fingerprinting for protection of varieties
	II	*Practical:* Methods on DNA fingerprinting
15	I	Genomic resource generation and trait validation
	II	*Practical:* Bioinformatics tools for characterization of genomic resources
	III	*Practical*: Digitalization of characterization and evaluation data
16	I	GMO detection technology
	II	Introduction to plant phenomics
	Field visit	Visit to Phytron Facility
17	I	IPR in PGR management
	II	*Practical:* Filling online application for germplasm registration
18	I	*Practical:* PGR Informatics and databases
	II	Genomic resource generation and trait validation
	III	Presentation by Participants
19	I	India's experience in plant variety protection – The way forward
	II	*Practical*: Procedure for farmer's variety registration (PPVFRA)
20	Exposure visit	Visit to Herbal Garden

Day	Session	Topics/Activity
21	I	Presentation by Participants
	II	Evaluation of participants for impact assessment and Feedback
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercise, demonstrations, discussions on actual problems faced, interaction, participants' personation and Field/ Laboratory/Facility/Museum/Gene Bank visits.

8. Programme Designed, Developed and Organized By:

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Course Coordinator(s) : Dr. Sandeep Kumar, Senior Scientist
Dr. S. Rajkumar, Senior Scientist

Programme: 6

1. **Title** : **Tools and Techniques for Analysis of Biomolecules**
2. **Organizing Institute** : ICAR-Indian Agricultural Research Institute, New Delhi
3. **Objective(s)** :
   - To aware the trainees on the importance of Biomolecules in life and
   - To strengthen and train human resource in advanced techniques of analysis of biomolecules
4. **Venue** : Division of Biochemistry, IARI, New Delhi
5. **Duration** : 02 weeks
6. **Category of employees** : Scientist
7. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Biomolecules for life: nutrient quality and intake at early and old age stages of life
	II	Characterization of Proteins
	III	*Practical:* Gel electrophoresis; Basis and Principles
2	I	Characterization of protein quality: Insights on protein structural and functional properties
	II	Proteome
	III-IV	*Practical:* Protein profiling by 2D electrophoresis method Western blotting: a technique to evaluation of protein levels
3	I	Starch fine structure and digestibility - a key to fine tune energy release
	II	Resistant starch : Food for thought to improve nutrition
	III-IV	*Practical:* Estimation of RS, SDS, RDS
4	I	Antioxidants: A key to good health
	II	Functional foods: Benefits, concerns and challenges
	III-IV	*Practical:* Estimation of polyphenols
5	I	Lipid quality analysis and enhancement
	II	Oils: rancidity control measures
	III-IV	*Practical:* Fatty acid profiling

Day	Session	Topic/ Activity
6	I	Nutri mix for enhanced nutrition
	II	Food matrix: Implications in processing and digestibility
	III-IV	*Practical:* Study of micro structure of food by Confocal Laser Scanning Microscopy
7	I	Ionome: for decoding mineral nutrient status
	II	Post Biotics: Significance in early life nutrition
	III-IV	*Practical:* Estimation of micronutrients
8	I	Plant metabolic pathway engineering: Prospective and applications
	II	Nutrigenomics: genome: food interface
	III-IV	*Practical:* Estimation of isoflavones and anthocyanins
9	I	Gene expression and analysis : Applications
	II	Starch Value Addition by Modifications: A Promise to Improve Human Nutrition
	III-IV	*Practical:* Gene expression analysis using qPCR
10	I	Group 1 & 2 presentations
	II	Group 3 & 4 presentations
	III	Discussion and interaction
11	I	Introduction to Phenomics
	Exposure visit	Visit to Phytotron and Phenomics
	Valedictory	Valedictory Programme

8. Pedagogy : Training programme consisted of lectures, practical exercise, demonstrations, discussions on actual problems faced, interaction, participants' presentation and Field/ Laboratory/Facility visits.

9. Programme Designed, Developed and Organized By:

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Course Coordinator(s) : Dr. Archana Sachdev, Principal Scientist
Dr. Vinutha T, Scientist

Programme: 7

1. **Title** : **Recent Advances of Bioinformatics in Agricultural Research: A Practical Perspective**
2. **Organizing Institute** : ICAR-Indian Agricultural Statistical Research Institute, New Delhi
3. **Objective(s)** :
   - To familiarize the participants with the various concepts, tools and recent advances in bioinformatics
   - To help in upgrading the analytical skills of the participants under NARES
4. **Duration** : 03 weeks
5. **Category of employees** : Scientist
6. **Course content (day-wise theory and practical course content):**

Days	Session	Topic/Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Bioinformatics in Agriculture
	II	An Overview of Bioinformatics: Different case studies
	III	Enhancement of Agricultural productivity by molecular application: Global status and challenges
2	I	Biological data resources of molecular data and its application in agriculture
	II	Pair-wise sequence alignment (BLAST)
3	I	Multiple sequence alignment (CLUSTAL)
	II	Introduction to R and its application in bioinformatics
4	I	Overview of Linux OS and its application in bioinformatics
	II	Overview of NGS Data and Its Pre-processing
5	I	Genome assembly and its evaluation
	II	Genome annotation : Gene prediction
6	I	Functional annotation of genome
	II	Web development : An Overview
7	I	Genomic data warehouse
	II	Perl programming
	III	Codon usage analysis
8	I	RNAseq data analysis
	II	Gene regulatory network

Days	Session	Topic/Activity
9	I	Interpersonal relationship : Soft skill development
	II	Data Mining : Supervised approach
10	I	SSR mining
	II	SNP mining
11	I	Genome wide association study
	II	Genomic selection
12	I	Small RNA prediction
	II	Splice Site prediction
13	I	miRNA prediction
	II	Metagenomics
14	I	Protein structure prediction
	II	Protein protein interaction : Docking
15	I	Molecular simulation and dynamics
	II	Epigenomics
16	I	Phylogenetic analysis
	Valedictory	Valedictory programme

7. Pedagogy : Training programme consisted of lectures, practical exercise, discussions on actual problems faced, interaction and Facility visits.

8. Programme Designed, Developed and Organized By:

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Programme: 8

1. **Title** : **Experimental Designs and Statistical Data Analysis**
2. **Organizing Institute** : ICAR-Indian Agricultural Statistics Research Institute, New Delhi
3. **Objective(s)** :
   - To familiarize the participants with the experimental designs and statistical techniques for analysis of data for making valid inferences from their agricultural research
   - To acquaint the participants with the use of statistical software packages for data analysis
   - To help in upgrading the analytical skills of the participants under NARES
4. **Duration** : 02 weeks
5. **Category of employees** : Scientist
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Descriptive statistics and exploratory data analysis
	II	MS-EXCEL: An overview
	III	MS-EXCEL: Data analysis
2	I	Testing of hypothesis and analysis of variance
	II	SAS: An overview
	III	*Practical:* Hands on SAS
	IV	*Practical:* Hands on testing of hypothesis
3	I	Correlation and regression analysis
	II	*Practical:* Hands on correlation and regression analysis
	III	Planning of experiments and basic experimental designs
	IV	Multiple comparison procedures
4	I	Data diagnostics and transformation
	II	Incomplete block designs
	III	*Practical:* Hands on basic experimental designs and incomplete block designs
	IV	Design resources server and Indian NARS statistical computing portal
5	I	Factorial experiments
	II	*Practical:* Hands on factorial experiments
	III	Analysis of covariance

Day	Session	Topic/ Activity
	IV	Split and strip plot design
6	I	Groups of experiments
	II	*Practical:* Hands on split/strip plot design and groups of experiments
	III	Response surface designs
	IV	Stability analysis and AMMI
7	I	SPSS for experimental data analysis
	II	*Practical:* Hands on SPSS for experimental data analysis
	III	Overview of R
	IV	*Practical:* Hands on R for experimental data analysis
8	I	Augmented designs
	II	Crossover designs
	III	Designs for mixture experiments
	IV	ASHOKA: Supercomputing hub
	V	Logit and probit analysis
9	I	Nonparametric tests
	II	*Practical:* Hands on nonparametric tests
	III	Statistical modelling
	IV	Multivariate analysis of variance
10	I	Principal component analysis
	II	Cluster and discriminant analysis
	III	*Practical:* Hands on principal component, cluster and discriminant analysis
	IV	Canonical correlation
	Exposure visit	Visit to National Agricultural Science Museum
11	I	Analysis of repeated measures data
	II	Online resources on design of experiments
	III	KRISHI: ICAR Research data repository
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercise, discussions on actual problems faced in statistical analysis, interaction, and Exposure visits.

8. Programme Designed, Developed and Organized By:

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Programme: 9

1. **Title** : **MDP for HRD Nodal Officers of ICAR for Effective Implementation of Training Functions**
2. **Organizing Institute** : ICAR-National Academy of Agricultural Research Management, Hyderabad
3. **Objective(s)** :
   - Developing and enhancing competencies of the HRD Nodal Officers to provide support and guidance in the implementation of capacity building programmes and training functions in the Institutes
4. **Duration** : 03 days
5. **Category of employees** : Scientist (HRD Nodal Officers)
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/Activity
1	Registration	Registration
	Introduction	Introduction
	I	Welcome & Course Outline
	II	Introduction to HR Function
	III	Overview of Competency Management System (CMS)
	IV	Development of competency framework
	V	Implementation of the CMS-Competency Need analysis, Competency mapping & Identification of competency gaps
2	I	Competency based TNA-I
	II	Competency based TNA-II
	III	Design and development of training programme
	IV	Training plans - Cadre training plans
3	I	Training Plans – Annual Training Plans
	II	Implementation of training
	III	Evaluation of training
	IV	Training Information Management
	V	Feedback Session
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, group discussions on actual problems faced and interaction.

8. Programme Designed, Developed and Organized By:

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Programme: 10

1. **Title** : **Intellectual Property Valuation and Technology Management**
2. **Organizing Institute** : ICAR-National Academy of Agricultural Research Management, Hyderabad
3. **Objective(s)** :
   - Enhancing competencies of the ITMU Nodal Officers/Members to provide support and guidance in the Intellectual Property Valuation and Technology Management at the ICAR-Institutes.
4. **Duration** : 05 days
5. **Category of employees** : Scientist (ITMU Nodal Officers/Members)
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/Activity
1	Registration	Registration
	Introduction	Introduction
	I	S&T innovations in Global economy in new normal
	II	IP & Technology Management
	III	Management of technologies for climate change
	IV	Protection of IP by PPVFRA
2	I	IP issues in R&D/ Business (Case study)
	II	Managing new innovations in agriculture/biotechnology
	III	Technology licensing deals
	IV	Opportunities in techno-entrepreneurship
3	I-II	IP valuation & business plan
	III	Management of grassroot Innovations
	IV	Conversion of agri technology to entrepreneurship
4	I	Agri Incubation eco system
	II	Market analysis and market plan/risk management
	III-IV	*Practical:* IP informatics & patent search - Hands on training
5	I	Business of biodiversity
	II	Technology commercialization
	III	Feedback
	IV	IP Policy of ICAR & its implementation
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical-Hands-on training, discussions and interaction.

8. Programme Designed, Developed and Organized By:

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Co-Course Director : Dr. K Srinivas, Principal Scientist
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Programme: 11

1. **Title** : **Priority Setting, Monitoring and Evaluation (PME) of Agricultural Research**
2. **Organizing Institute** : ICAR-National Academy of Agricultural Research Management, Hyderabad
3. **Objective(s)** :
   - To enhance competencies of the In-charges/Members of PME cell of ICAR-Institutes to provide basic principles of Research Priority Setting, Monitoring and Evaluation (PME) of Agricultural Research
   - To develop the capacity of the In-charges/Members of PME cell in ensuring that research activities are carried out in accordance with a plan and are evaluated in the pursuance of the objectives of the organization
4. **Duration** : 06 days
5. **Category of employees** : Scientist (Heads, In-charges, Members of the PME Cell)
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	I	Overview/Setting the Stage
	II	Research Governance framework of ICAR & Role of PME (QRT / RAC / IRC / RCM)
	III	Research Project Management: An Overview
	IV	Prioritization of Research Projects- ICAR Guidelines
2	I	Prioritization of Research Domains / Concepts using Online Tools
	II	Prioritization of Research Projects: Tools & Practices
	III	Monitoring & Evaluation (M&E) of Research Projects - ICAR Guidelines
	IV	Key concepts for M&E (OVI, MoV, CA, Hierarchy of Objectives)
3	I	Log frame approach for monitoring and evaluation
	II	Monitoring and Evaluation: Tools & practices
	III	Impact Assessment of Research Projects: Guidelines & good practices
4	I	Contract Research & Services: Guidelines/ case studies/exercises
	II	Training & Consultancy Services: Guidelines/case studies/exercises
	III	Technology and IP Management: Guidelines/case studies/exercises
	IV	ABS and biodiversity laws relevant to agricultural research
5	I	Handling Research Publications: Guidelines & good practices

Day	Session	Topic/ Activity
	II	Frameworks for measuring research Performance: Trends
	III	Research publications – Averting plagiarism & predatory journals
	IV	Metrics for measuring quality: Journals, individuals and institutions
6	I	Budgeting for research in EFC / SFC memo
	II	Handling correspondences with HQs (Parliamentary Questions & Others)
	III	Evolving roles of PME cells in Research Management
	Valedictory	Feedback & Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practices, discussions on actual problems faced, interaction and case studies.

8. Programme Designed, Developed and Organized By:

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Programme: 12

1. **Title** : **Workshop on Administrative Vigilance for Vigilance Officers of ICAR-Institutes**
2. **Organizing Institute** : ICAR-National Academy of Agricultural Research Management, Hyderabad
3. **Objective(s)** :
   - Developing competencies of the Vigilance Officers to provide support for vigilance matters in the Institute
4. **Duration** : 03 days
5. **Category of employees** : Scientist (Vigilance Officers)
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1.	Registration	Registration
	Inaugural	Inaugural Programme
	I	Duties and responsibilities of Vigilance Officers
	II-III	Disciplinary rules & procedures
2.	I	Preventive vigilance
	II	Conduct rules
	III	Establishment related matters (Recruitment /Promotion)
	IV	Disciplinary proceedings
3.	I-II	Purchase procedures
	Valedictory	Feedback & Valedictory Programme

7. **Pedagogy** : Training programme consisted of lectures, practices, discussions on actual problems faced, interaction, and case studies.
8. **Programme Designed, Developed and Organized By:**

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Co-Course Director	:	Shri B. D. Phansal, Joint Director & Registrar Email: jdar@naarm.org.in

4.2

TECHNICAL STAFF

Technical Staff

Programme: 1

1. **Title** : **Good Agricultural Practices (GAPs) for Enhancing Resource Use Efficiency and Farm Productivity**
2. **Organizing Institute** : ICAR-Indian Agricultural Research Institute, New Delhi
3. **Objective(s)** :
   - To impart training on good agricultural practices for enhancing productivity and profitability
   - To provide practical orientation of advanced tools and techniques used for efficient crop management
4. **Venue** : Division of Agronomy, IARI, New Delhi
5. **Duration** : 10 days
6. **Category of employees** : Technical
7. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	GAP's in sugarcane production system
	II	Improved agronomy for enhancing farm productivity and profitability
	III	Good agricultural practices for subtropical fruit cultivation
2	I	Soil health management for sustained productivity and profitability
	II	Agronomic means for enhancing moisture use efficiency under rainfed conditions
	III	GAP for makhana production
	Field visit	Visit to IFS experiments – a practical orientation irrigated system
3	I	Good agricultural practices for organic based systems
	II	Good agricultural practices to enhance oilseed productivity for doubling farm income
	III	GAP in CA based system
	IV	Physiological aspects for harnessing high crop productivity
4	I	Transfer of improved technologies at farmers doorstep
	II	Good agricultural practices for biotic stress management in cereals
	III	Biodiversity conservation for sustaining crop productivity and practical orientation to germplasm conservation at NBPGR
	IV	Good agricultural practices in salinity management

Day	Session	Topic/ Activity
5	I	Zn bio-fortification for nutritional security and sustained productivity
	II	Good agricultural practices for mechanization in agriculture
	III	Good agricultural practices under agroforestry systems
	IV	*Practical:* Soil testing through STFR for enhanced resource use efficiency and farm income
6	I	Good agricultural practices for organic farming
	II	*Practical:* Soil organic carbon estimation
	III	Irrigation scheduling in surface irrigation for enhancing farm profitability
7	I	Good agricultural practices for remediation of heavy metals in contaminated soils
	II	Good agricultural practices in floriculture
	III	*Theory & Practical:* Good agricultural practices (GAPs) in vegetable production
	IV	Small farm implements for enhancing resource use efficiency and profitability
8	I	*Theory & Practical:* Bio resource utilization for enhanced resource use
	II	Good agricultural practices for integrated crop management
	III	Water harvesting recycling technique
	Exposure visit	Glimpses of development of Indian Agriculture at NAAS museum
9	I	Vermi-composting for enhanced farm profitability
	II	Post-harvest and value addition for enhancing farm profitability
	Valedictory	Valedictory Programme

8. Pedagogy : Training programme consisted of lectures, practical exercise, demonstrations, discussions, interactions, and Field/Laboratory/Exposure visits.

9. Programme Designed, Developed and Organized By:

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Programme: 2

1. **Title** : **Layout and Maintenance of Field Experiments and Recording Observations**
2. **Organizing Institute** : ICAR-Indian Agricultural Research Institute, New Delhi
3. **Objective(s)** :
   - To improve the skill and aptitude of Technical staff in the management of field experiments
   - To learn soil and plant sampling methods and recoding data or observations
4. **Venue** : Division of Agronomy, IARI, New Delhi
5. **Duration** : 10 days
6. **Category of employees** : Technical
7. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Principles of field experimental designs
	II	Growth and phenological observations in important field crops
	III	Pre-evaluation of the participants' aptitude
	IV	Observation on seed germination and viability in seed production technologies
2	I	Observations & recording data in Integrated Farming System
	II	Field observations and layout for organic based cropping systems
	III	Laboratory analytical methodology in Bio-technology
	IV	*Practical:* Estimation of soil moisture using conventional and advanced tools
	V	*Practical:* Soil and plant analysis using advance devices and equipment
3	I	Various indices for estimation of resource use efficiency in different crops and cropping systems
	II	*Practical:* Observations and data collections in crop diversification experiments
	III	Understanding soil physical health for recording observations
	IV	*Practical:* Computation of weed competition indices in weed management experiments
	V	4 R Stewardship for higher nutrient use efficiency

Day	Session	Topic/ Activity
4	I	*Practical:* Recording chronological observation in integrated crop management studies
	II	*Practical:* Field observation and data recording in dry land areas
	III	Conducting hydrogel based field experimentation
	IV	*Practical:* Layout and maintenance of experimental fields for vegetable crops
5	I	Field experimentation and observation on soybean crop
	II	Observation and data interpretation in different millets experiments
	Field visit	Visit to dry land / rainfed experiments
6	I	*Practical:* Recording data in plant root related observations using modern devices & techniques
	Field visit	Enhancement of WUE through water budget equation in Meerut in different cropping system
	Field visit	Visit to Integrated farming system experiments
7	Field visit	Visit to conservation agriculture experiments
	II	Geo-spatial analysis under GIS environment
	III	Characterizing qualitative traits in organic agriculture
8	I	Observations and interpretation with different farm implements
	II	*Practical:* Field layout, sampling and data observation under CA Experiments
	III	Statistical tools for assessing economic viability in field experiments
	IV	*Practical:* Methodology for estimation of GHGs emission from experimental fields
9	I	Novalagro-techniques in quality seed production in wheat
	II	*Practical:* Field experiments on stress Agriculture and recording observations
	III	Site specific nitrogen management in rice- wheat cropping system
	IV	Soil sampling & processing for nutrient management
10	Field Visit	Visit to CPCT, IARI, New Delhi
	II	*Practical:* Field experimentation and data recording in rainfed Integrated Farming System
	III	Field observations and data analysis using precision agricultural gadgets
	IV	Post-evaluation of the Participants' aptitude
	Valedictory	Valedictory Programme

8. Pedagogy : Training programme consisted of lectures, practical exercise, demonstrations, discussions on actual problems faced, interactions, and Field/Exposure visits.

9. Programme Designed, Developed and Organized By:

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Programme: 3

1. **Title** : **Application of Remote Sensing and GIS in Natural Resource Management**
2. **Organizing Institute** : ICAR-Indian Institute of Soil and Water Conservation, Dehradun
3. **Objective(s)** :
   - To explore the concepts of RS, GIS and GPS technologies and their various applications
   - To exercise the use of geospatial technologies in the field of agriculture and natural resource management for preparation of GIS resource inventory, monitoring, planning and execution
   - To provide an opportunity to the participants to expose to the field level practical exercise and interactions with the resource persons
4. **Duration** : 10 days
5. **Category of employees** : Technical
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Emerging paradigm of integrated watershed management
	II	Basic of Remote Sensing, Visual and digital image analysis: Image interpretation
2	I	Introduction to GIS, terminology, spatial and non-spatial data
	II	Recent trends in application of RS and GIS in integrated watershed management
	III	*Practical:* Familiarization of GIS software
3	I	Principles of GPS and its applications
	II	*Practical:* Survey using total station instruments and survey
	III	Survey using GPS operation
4	Exposure visit	Museum Visit
	II	Open Sources Data and method to access
	Field visit	Visit to Selaqui Farm
5	I	Overview of participatory approaches in integrated watershed management
	II	Digital elevation model and interpretation
	III	DEM preparation from survey data and open source data
6	I	Introduction to open source GIS software and data

Day	Session	Topic/ Activity
	II	Introduction to Google earth and its applications
	III	Digitization and attribute handling and use of Google earth
7	Field visit	Visit to Sainji watershed
8	I	Image classification
	II	Land use land cover mapping and accuracy assessment
	III	Land use classification and thematic mapping
9	I	Geo-spatial technologies and its applications
	II	Integration of thematic layers in GIS environment
	III	Preparation of thematic layers, projections
10	I	Watershed delineation, stream ordering
	II	Discussion and feedback
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercise, demonstrations, discussions on actual problems faced, interactions, and Field/Exposure visits.

8. Programme Designed, Developed and Organized By:

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Programme: 4

1. **Title** : **Fundamental Concepts and Methodology for Agricultural Water Management**
2. **Organizing Institute** : Water Technology Centre, ICAR-IARI, New Delhi
3. **Objective(s)** :
   - To understand the fundamental concepts of irrigation science, soil moisture measurement and conservation; and integrated watershed management
   - To explain theoretical concepts and practical approach for the basic hydrological properties, *in-situ* and *ex-situ* rain water harvesting and its storage
   - To learn hands on operation of micro irrigation system, soil and water quality analysis; application of modern instruments applicable in operation of the system
4. **Venue** : Water Technology Centre, IARI, New Delhi
5. **Duration** : 01 week
6. **Category of employees** : Technical and young Scientist
7. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	Exposure visit	Visit to WTC museum and all laboratories
	II	Fundamental concepts and principles of irrigation science and measurements of soil and water parameters/constants
	III	Fundamental concepts of irrigation water application and soil moisture management in major field crops
	IV	Irrigation scheduling criteria of major field crops and instrumentation
2	I	*In-situ* soil moisture conservation & design of water harvesting structures
	II	Artificial ground water (GW) recharge and GW table measurement techniques
	III	Fundamental concepts of soil moisture content and soil moisture indices as a basis of irrigation
	IV	*Practical:* Field determination of soil moisture contents by gravimetric method and other modern instruments, determination of field capacity (FC) and wilting Point
	V	Water measuring devices in irrigation and drainage structures
	VI	*Practical:* Measurement of discharge of an open channel and a pipe flow and estimation of the conveyance losses

Day	Session	Topic/ Activity
3	I	*Practical:* Laboratory determination of soil and water quality and estimation of fertilizer requirements based on major soil nutrients (NPK) analysis
	II	*Practical:* Field measurement of instantaneous infiltration rate and basic infiltration rate/ infiltrability
	III	Nobel virtues required for doing better sciences and diligent research work by scientific/ technical officers (Integrity, responsibility, sincerity, accuracy, dedication and compliance of instructions from the superior officers)
	IV	Concepts of soil structure, texture, filed capacity, wilting point and water holding capacity
	V	*Practical:* Laboratory determination of soil structure, texture, field capacity, wilting point and water holding capacity
4	Field/Exposure visit	Water management of various crops under protected cultivation and introduction to hydroponics, aquaponics and aeroponics systems clubbed with IARI museum and National Agricultural Science Museum
	I	*Practical and Field Visit:* Field visit for diagnostic analysis of canal irrigation from head works of a canal system to farmer's field through different channels to measure the discharge, conveyance and water distribution efficiencies on Upper Ganga Canal in Meerut, U.P.
5	I	Fundamentals of water quality for irrigation
	II	*Practical:* Laboratory analysis of water quality
	III	*Theory and Field Visit:* Low cost wastewater treatment techniques for urban and rural dwellings and utilization of treated waste water and its by-products
6	I	Introduction to modern systems of irrigation and on-farm water management and drainage systems at IARI Farm
	II	*Theory and Field Visit:* Design, operations and maintenance of pressurized farm irrigation systems
	III	*Theory and Practical:* How economical is the water application for crop production? Improving the efficiency
	IV	*Theory and Field Visit:* Automated irrigation of orchards and vegetable crops using sensors and solar pumping systems
	V	Fundamental concept of weather parameters and their interrelations with crop water requirements *Practical and Field Visit:* Measurements of weather variables and visit to automatic weather station
	VI	*Practical:* Use of computers in agricultural water management and introduction to FAO CROPWAT/IRRISIS models and course evaluation by the participants
	Valedictory	Valedictory Programme

8. Pedagogy : Training programme consisted of lectures, practical exercise, demonstrations, discussions, interactions, and Field/Laboratory/Facility/Exposure visits.

9. Programme Designed, Developed and Organized By:

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Programme: 5

1. **Title** : **Farm Management**
2. **Organizing Institute** : ICAR-Indian Institute of Farming Systems Research, Modipuram
3. **Objective(s)** :
   - To acquaint the technical staff with basic principles of farm management
   - To upgrade the technical staff in different methodologies and technical management approaches to overcome the constraints of modern agriculture
4. **Duration** : 01 week
5. **Category of employees** : Technical staff associated with Farm/Farm Manager
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Pre- training evaluation
	II	Proven principles of effective goal setting for successful farm management
	III	Contact labour issues, purchase rules and disposal of farm produce
	IV	*Theory & Practical*: Integrated farming system models for different agro-climatic zones of India
2	I	*Practical:* Soil testing procedures and calculation of fertilization doses
	II	*Theory & Practical*: Identification & management of pest and disease in crops
	III	*Theory & Practical*: Management practices for Basmati rice production
	Field visit	Visit to IFS Unit of IIFSR, Modipuram and CPRI Regional Station, Modipuram
	V	*Theory & Practical*: Management of problematic soil
3	I	Sustainable development of farm management through precision farming
	II	Reproduction management in livestock farms
	III	*Theory & Practical*: On-farm record keeping and accounting procedures
	IV	*Theory & Practical*: Fishery management in IFS
	V	Ethics in farm management with special reference to research and extension activities

Day	Session	Topic/ Activity
4	I	Precision nutrient management for improved nutrient availability on farms
	II	*Theory & Practical*: Principals of selection of enterprises for multi-enterprises farm
	III	*Theory & Practical*: Farm implements and gender sensitive farm tools
	IV	Climate smart farm management
	V	Income increasing possibilities of farmers through organizational management of agri finance
5	I	Effect of changes in attitude on behaviour and work efficiency
	II	Soft skills development
	III	*Theory & Practical*: Scientific management of orchard for successful fruit cultivation
	IV	*Theory & Practical*: Management of farm products by value addition
6	Exposure visit	Visit at Patanjali Farm, Haridwar
7	I	Post training evaluation
	II	*Theory & Practical*: Cropping Scheme preparation and evaluation for enhancing farm income and efficient resource utilization.
	III	*Theory & Practical*: Breeding, feeding and health management of poultry farm
	IV	Experience sharing among the participants
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercise, demonstrations, discussions on actual problems faced, interactions, experience sharing, and Field/Lab/ Exposure visits.

8. Programme Designed, Developed and Organized By:

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Programme: 6

1. **Title** : **Agrometeorological Data Collection, Analysis and Management**
2. **Organizing Institute** : ICAR-Central Research Institute for Dryland Agriculture, Hyderabad
3. **Objective(s)** :
   - To acquaint the technical staff with basic principles and practices of agrometeorological data collection
   - To develop the competency of technical staff for agrometeorological data analysis and management
4. **Duration** : 10 days
5. **Category of employees** : Technical
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Basic concepts of Agrometeorology
	II	Met instruments – principles and practices
	III	*Practical:* Radiation instruments and data collection
2	Exposure visit	Visit to ICRISAT and Agromet Observatory
3	I	Climate change and its impact on agriculture
	II	District contingency plans: Experiences
	III	*Practical:* Statistical analysis of agromet data including RF Probability
4	I	Collection of weather data from web sources
	II	Details of Met web services
	III	*Practical:* Agroclimatic indices and their application
	Exposure visit	Visit to IMD, Hyderabad (Met. Instruments & Doppler Radar)
5	I	Agromet Database Management and its applications
	II	Impact of extreme events on agriculture and allied sectors
	III	Crop weather relationships
	IV	Weather cock-I

Day	Session	Topic/ Activity
6	I	Understanding the features of CWOL and IMD websites
	II	Weather forecasting, DSS Tools and their application in Agriculture
	III	Basics *of* Agromet advisory
	IV	Micro level Agromet Advisory services
7	I	Characteristics of Indian monsoon
	II	Weather based pest disease management
	III	Weather based water management
	IV	PET calculator
8	I	Basics of drought & drought indices
	II	*Practical:* Dry spell analysis
	III	Weather parameters influencing Horticulture crops
	Field visit	Visit to Hayathnagar NICRA facilities
9	I	Feedback and Discussion
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, exercises, demonstrations, discussions on actual problems faced, interactions, and Field/Exposure visits.

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Programme: 7

1. **Title** : **Precision Agriculture Technologies**
2. **Organizing Institute** : ICAR-Indian Agricultural Research Institute, New Delhi
3. **Objective(s)** :
   - To impart training to technical staff of ICAR for handling of precision instruments/ equipments
   - To develop skill in data acquisition methodologies required in precision Agriculture
4. **Venue** : Division of Agricultural Engineering, IARI, New Delhi
5. **Duration** : 01 week
6. **Category of employees** : Technical
7. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Precision farming-concept, need, technology and applications
	II	Precision technologies for small farm mechanization
	III	*Practical:* Hands on training in workshop and different labs for design and development of precision machinery
2	I	Irrigation water management for precision agriculture
	II	Precision machinery for dryland agriculture
	III	Soil moisture sensing for automation of irrigation system
	Field visit	Acquaintance with operationalization of different precision machineries in FOSU
	V	Gender friendly precision farm equipment
3	I	Precision planting technology (VRT and Pneumatic Planting)
	II	Practical on Pneumatic precision planter
	III	*Practical:* Aqua-ferti-drill for precise water and fertilizer application
	IV	*Practical:* Animal feed block making machine for nutri-rich animal feeding
	V	*Practical:* Compost making technology for soil health management
4	I	Precision farming and plasticulture applications in protected cultivation
	II	Crop protection, public health and environmental safety
	III	Ergonomically designed farm equipment for enhancing performance efficiency and operator safety
	IV	Solar powered technologies for precision farming

Day	Session	Topic/ Activity
5	I	Geo-informatics in precision farming
	II	Precision machinery for soil nutrient and plant residue management
	Exposure visit	Acquaintance with precision farming in CPCT
	Exposure visit	Acquaintance with precision machinery in FOSU
6	I	Custom hiring of precision farm machinery Equipments/implements
	II	Govt. Initiatives and policy framework for mechanization of agriculture
	III	Raising agricultural productivity and making farming remunerative for farmers through Engineering interventions
	Valedictory	Valedictory Programme

8. Pedagogy : Training programme consisted of lectures, practical exercise, demonstrations, discussions on actual problems faced, interactions, and Field/Exposure visits.

9. Programme Designed, Developed and Organized By:

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Programme: 8

1. **Title** : **Appropriate Sampling Techniques including Preparation and Preservation for Soil, Water, Plant and Air Samples**
2. **Organizing Institute** : ICAR-Indian Agricultural Research Institute, New Delhi
3. **Objective(s)** :
   - To provide the basic guidelines for the collection of soil, plant, water and air samples for appropriate analysis
   - To strengthen the capabilities of technical staff for proper soil, plant, water, and air sampling, including sample preparation and preservation
4. **Venue** : Centre for Environment Sciences and Climate Resilient Agriculture, IARI, New Delhi
5. **Duration** : 01 week
6. **Category of employees** : Technical
7. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Importance of sampling and sample processing
	II	*Practical:* Soil sample collection and processing
	III	*Practical:* Demonstration of the instruments used in soil sampling and analysis
2	I	Water sampling, preservation and storage for various analysis
	II	Plant sample collection, processing and digestion
	III	*Practical:* Demonstration of the instruments used in plant sampling and analysis
	IV	*Practical:* Demonstration of the instruments used in water sampling and analysis
3	I	Air quality parameter and indices and air sample collection for pollution monitoring
	II	GHG sampling and analysis
	III	*Practical:* Demonstration of the instruments used in air sampling and analysis
	IV	*Practical:* Demonstration of the instruments used in GHG sampling and analysis

Day	Session	Topic/ Activity
4	Field/Exposure visit	Field demonstration of the soil and plant sampling
	Field/Exposure visit	Field demonstration of the water sampling
	Field/Exposure visit	Field demonstration of the air sampling
	Field/Exposure visit	Field demonstration of the GHG sampling
5	I	Good laboratory practices and safety measures
	II	Soil Quality parameter and indices
	III	Water quality parameters and indices
	Valedictory	Feedback & Valedictory Programme

8. Pedagogy : Training programme consisted of lectures, practical exercise, demonstrations, discussions on actual problems faced, interactions, and Field/Lab/Exposure visits.

9. Programme Designed, Developed and Organized By:

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Programme: 9

1. **Title** : **Use and Maintenance of Advanced Instruments in Soil and Plant Analysis**
2. **Organizing Institute** : ICAR-Indian Institute of Soil Science, Bhopal
3. **Objective(s)** :
   - To enhance competency of technical staff of ICAR involved in soil and plant analysis
   - To ensure better maintenance of instruments in different ICAR laboratories
4. **Duration** : 01 week
5. **Category of employees** : Technical
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Laboratory working principles & precautions
	II	*Theory & Practical:* Use & maintenance of pH meter
	III	*Theory & Practical:* Use & maintenance of EC meter
2	I	*Theory & Practical:* Flame photometer
	II	*Theory & Practical:* Spectrophotometer
	III	*Theory & Practical:* CHN analyzer
3	I	*Theory & Practical:* Kjeldahl N distillation system
	II	*Theory & Practical:* Flow injection analyzer
	III	*Theory & Practical:* TOC
4	I	*Theory & Practical:* Gas chromatography
	II	*Theory & Practical:* HPLC
	III	*Theory & Practical:* MIR spectrophotometer
	IV	*Theory & Practical:* TXRF
5	I	*Theory & Practical:* Pressure plate apparatus
	II	*Theory & Practical:* Cone penetrometer
	III	*Theory & Practical:* Yoder apparatus/Permeameter
	IV	*Theory & Practical:* Pressure chamber apparatus

Day	Session	Topic/ Activity
6	I	*Theory & Practical:* IR gas analyzer
	II	*Theory & Practical:* AAS
	III	*Theory & Practical:* ICP-OES
	Valedictory	Valedictory Programme

**All topics included Principle, hands-on operation, precaution & maintenance of the respective instruments*

7. Pedagogy : Training programme consisted of lectures, practical exercise, demonstrations, discussions on actual problems faced, interactions, and Lab visits.

8. Programme Designed, Developed and Organized By:

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Programme: 10

1. **Title** : **FCV Tobacco Field Crop Management**
2. **Organizing Institute** : ICAR-Central Tobacco Research Institute, Rajahmundry
3. **Objective(s)** :
   - To improve skills and efficiency of technical personnel engaged in research/ extension/ field management of tobacco crop
   - To acquaint the trainees about emerging issues in tobacco cultivation
4. **Duration** : 01 week
5. **Category of employees** : Technical personnel of ICAR & Field Officials working in Tobacco
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Pre-training Evaluation (Assessment of knowledge level of participants on FCV tobacco Production Technology)
	II	FCV tobacco production matrix in India
	III	Soil related production constraints and management
2	I	Tobacco cultivars in vogue - their characteristics
	II	*Practical:* Tobacco cultivars in vogue - their characteristics
	III	Healthy seedling production and transplanting
	IV	*Practical:* Healthy seedling production and transplanting
3	I	Integrated management of Insect-pests and diseases
	II	*Practical:* Integrated management of Insect-pests and diseases
	III	Non-monetary input management
	IV	*Practical:* Exercise on fertilizer dose calculations
4	I	Water and weed management in tobacco production
	II	Topping, sucker control and ripe leaf harvest
	III	Do's and Don'ts of Pesticide application and CPA residues
	IV	*Practical:* Do's and Don'ts of Pesticide application and CPA residues

Day	Session	Topic/ Activity
5	I	Pesticide formulations and requirements- concepts and computations
	II	In season contingency measures in FCV tobacco
	III	Tobacco leaf curing and recent advances in fuel saving techniques
	IV	Physical grading of tobacco leaf
6	Field visit	Visit to Auction platform
	II	Leaf quality chemical characteristics and their management
	III	Produce management, market intelligence and marketing
	IV	Technology dissemination methods in FCV tobacco
	V	Post training evaluation and feed back
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercise, demonstrations, discussions on actual problems faced, interactions, and Field/Lab/Exposure visits.

8. Programme Designed, Developed and Organized By:

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Programme: 11

1. **Title** : **Physiological Investigations for Analysis of Crop Responses to Climate Change**
2. **Organizing Institute** : ICAR-Indian Agricultural Research Institute, New Delhi
3. **Objective(s)** :
   - To impart basic understanding and relevance of different physiological processes and parameters of crop plants in relation to climate change
   - To improve skills related to measurements and analysis of different physiological traits and parameters
   - To provide interpretation of physiological changes that occur due to the climate change on the crop plants
4. **Venue** : Division of Plant Physiology, IARI, New Delhi
5. **Duration** : 10 days
6. **Category of employees** : Technical
7. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Different abiotic stresses faced by crop plants due to climate change and their impact
	II-III	Introduction to National Phenomics Facility for climate change research
2	I	Facilities used in climate change research (OTC, FACE, Temperature gradient tunnel, Controlled environment facility and Phytotron etc.)
	II	*Practical:* Methodology and applied aspects of conducting research using OTC, FACE, Temperature gradient tunnel, Controlled environment facility and Phytotron
	III	*Theory and Practical:* Tools and techniques used for high throughput and non-destructive phenotyping of plants in National Phenomics Facility
	IV	*Practical:* Non-destructive phenotyping/screening for abiotic stress tolerance in Phenomics Facility
3	I	Importance and significance of plant growth analysis
	II	*Practical:* Measurement of plant growth parameters
	III	Use of radio isotopes and radiations in climate change research
	IV	Impact of climate change on stem reserves, stem reserve mobilization and stay green traits

Day	Session	Topic/ Activity
4	I-II	*Theory & Practical:* Photosynthesis - A key physiological process: Influence of climate change and its measurement (along with related parameters) by using IRGA
	III	Impact of climate change on Indian agriculture
	IV	*Theory & Practical:* Non-destructive estimation of photosynthetic pigments by SPAD, Chlorophyll concentration meter and NDVI meter
5	I	*Theory & Practical:* Procedures and precautions in solution preparation for physiological and biochemical investigations
	II	*Theory & Practical:* Stability of photosynthetic pigments: A trait for abiotic stress tolerance in crop plants
	III	*Practical:* Non-destructive measurement of crop temperature by IR gun and IR thermal imaging technique
	IV	*Practical:* Determination of soil and plant water status (relative water content, water potential, tensiometer, TDR etc.)
6	I	*Theory:* Plant pigments: significance, role and impact of environment and climate change
	II	*Practical:* Profiling of plant pigments by TLC technique
	III	*Practical:* Measurement of membrane stability index (MSI) and lipid peroxidation
	IV	*Practical:* Determination of stomatal density and stomatal index on plant surfaces
7	I	*Practical:* Measurement of chlorophyll fluorescence: non-destructive method for assessment of photosynthetic efficiency
	II	*Practical:* Sampling techniques and methods of digestion of plant samples for nutrient analysis
	III	*Practical:* Measurement of nutrients/micronutrients in plant samples by ICP-OES
	IV	*Practical:* Measurement of plant respiration by IRGA
8	I	Plant root system, root growth and root system architect
	II	*Practical:* Methods for measurement of root growth and root system architect and other related parameters.
	III	*Theory & Practical:* Impact of climate change on phosphorus use efficiency and its measurements
	IV	*Theory & Practical:* Impact of climate change one nitrogen use efficiency and its measurements
9	I	*Practical:* Assay of antioxidant enzymes in plant samples - Superoxide dismutase (SOD) and peroxidase (POX)
	II	*Theory and Practical:* Statistical analysis of data: Basic tools and procedures
	Valedictory	Valedictory Programme

8. Pedagogy : Training programme consisted of lectures, practical exercise, demonstrations, discussions on actual problems faced, interactions and Field/Laboratory/Facility visits.

9. Programme Designed, Developed and Organized By:

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Programme: 12

1. **Title** : **Identification of Insect-Pests/Vectors/ their Damaging Symptoms and Management**
2. **Organizing Institute** : ICAR-Indian Agricultural Research Institute, New Delhi
3. **Objective(s)** :
   - To impart knowledge about identification of different insect-pest and their natural enemies
   - To impart training on mass rearing techniques for different insect-pest and natural enemies
   - To impart training on technical knowhow of integrated pest management
   - To impart hands on training on different entomological instruments
4. **Venue** : Division of Entomology, IARI, New Delhi
5. **Duration** : 02 weeks
6. **Category of employees** : Technical
7. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Insect biodiversity
	II	Basics of Insect Pest Management (IPM)
	III	*Practical:* Collection, stretching and pinning of insects
2	I	Identification of insect-pests of rice/wheat and their management
	II	Identification of insect-pests of cotton and their damage
	III	Bioassay
	IV	Practical approaches of pesticides
3	I	Identification of insect-pests of mustard and their management
	II	Identification of insect-pests of vegetables and their management
	III	*Practical:* Identification of insect-pests of vegetables and their management
	IV	Identification of Insect-pest of fruits
4	I	Management of insect-pests of fruits
	II	Identification and management of fruit fly
	III	Identification of insect-pest of storage and their management
	IV	*Practical:* Identification of insect-pest of storage and their management

Day	Session	Topic/ Activity
5	I	Rearing techniques for insects
	II	Insect pheromones: An ecofriendly component for insect pest management
	III	Basics of Insect toxicology
	Field visit	Field identification of damage materials /Insect-pests of rice and their management
6	I	Identification of insect-pests of pulses and their management (chickpea)
	II	*Practical*: Symptoms and Identification of insect-pests of vegetables in field
7	I	Basics of biological control of insect-pests
	II	Basics of pesticide residue
	III	Identification and mass multiplication of parasites and parasitoids
	IV	Use of microscope/Scanning Electron Microscopy
8	I	Management in protected cultivation
	II	Insect-pests of Pigeon pea: Identification and their management
	III	Spraying equipment, precautions and antidotes
	IV	Identification of white fly and its management
9	I	Insect-pest of flowers
	II	Scientific lac cultivation on conventional hosts for enhanced income
	III	Identification of insect-pests of maize and sorghum their management
	IV	Bioassay
10	I	*Practical:* Mass production of important predators of insect-pests
	II	Role/ Importance of honey bees
	III	Automation of insect rearing
	Field visit	Field visit to identify insect pests and damaged material
11	I	Diagnosis of phytoplasma disease and their insect vectors
	II	Whitefly transmission of plant viruses and management of vector borne diseases
	III	Diagnosis of virus diseases
	IV	Identification of thrips and virus transmission
12	I	Role of plant product in management of pests
	II	Quarantine insect-pests
	III	Digital tools for an improved integrated pest management
	IV	*Practical:* Mass multiplication of hemipteran hosts for production of natural enemies
13	I	Entomophathogenic nematodes for pest management
	II	Live demonstration of Apiculture
	III	Discussion and feed back
	Valedictory	Valedictory function

8. Pedagogy : Training programme consisted of lectures, practical exercise, demonstrations, discussions on actual problems faced, interactions and Field/Laboratory/Facility visits.

9. Programme Designed, Developed and Organized By:

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Programme: 13

1. **Title** : **Principles of Seed Production, Processing, Storage and Quality Assurance**
2. **Organizing Institute** : ICAR-Indian Institute of Seed Science, Mau
3. **Objective(s)** :
   - To enhance capacity of technical staff for quality seed production through hands-on practical training in production, processing, storage & quality assurance
4. **Duration** : 10 days
5. **Category of employees** : Technical
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Indian quality seed scenario – An overview
	II	Pre-evaluation test
	III	Basic principles of quality seed production
	IV	Maintenance of nucleus and breeder seed in self & cross pollinated crops
	Field visit	Visit and acquaintance with seed production methodologies
2	I	Evolution of seed testing and international organizations in seed quality assurance.
	II	Seed Production in rice and wheat
	III	Principles and methods of seed storage with emphasis on community and village seed banks
	Lab visit	Visit to ICAR-IISS labs
3	I	Seed processing & upgrading – Principles & methodology
	II	Implications of seed dormancy and storage behaviour
	III	OECD schemes and other opportunities available to seed entrepreneurs/StartUps for seed exports
	IV	*Practical*: Exposure on dormancy types and dormancy breaking measures and seed testing protocols
4	I	Importance of seed quality: factors determining seed quality
	II	Seed sampling : An overview
	III	Physical purity analysis of seed lots (components of physical purity, principles, working sample, pure seed definition and calculation of components)
	IV	*Practical*: Exposure on seed sampling & purity analysis

Day	Session	Topic/ Activity
5	I	Seed viability and vigour testing – concept & methodology
	II	Seed germination & evaluation
	III	Seed certification-concepts and brief overview on IMSCS
	IV	*Practical*: Exposure of germination testing
6	I	Genetic purity testing: Objectives, principles and methods involved. Use and limitations of laboratory, green house and field plot methods in determination of genuineness of cultivars
	II	Relative humidity and equilibrium moisture content of seed; Moisture testing
	III	New dimensions in seed certification: OECD scheme
	IV	*Practical*: Exposure on seed processing
7	Exposure visit	Visit to NSRTC & IAS, BHU, Varanasi
8	I	Molecular means of genetic purity assessment: An overview
	II	Seed quality enhancement through priming , coating and pelleting
	III	Economics of quality seed production – case study
	IV	*Practical*: Exposure on priming, coating and pelleting
9	I	Comprehensive outlook on seed legislations and regulations
	II	Seed Health Management
	III	Seed Planning: Implications of SMR
	IV	Elucidation on determination of genuineness of varieties
10	I	Seed Bioprospecting: Overview on disease management
	II	Model deployment: Participatory seed production
	III	Second & Third generation seed quality augmentation strategies
	IV	Interaction of trainees with subject matter experts – discussion & feedback on course curriculum
	Valedictory	Valedictory Programme

7. **Pedagogy** : Training programme consisted of lectures, practical exercise, demonstrations, discussions on actual problems faced, interactions, case study and Field/Laboratory/ Facility/Exposure visits.

8. Programme Designed, Developed and Organized By:

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Programme: 14

1. **Title** : **Principles and Production Techniques of Hybrid Seeds in Vegetables**
2. **Organizing Institute** : ICAR-Indian Institute of Vegetable Research, Varanasi
3. **Objective(s)** :
   - To develop knowledge and skills of technical staff working in the latest and advanced techniques required in the field of vegetable hybrid seed production
   - To expose to all related aspects of hybrid seed production
4. **Duration** : 02 weeks
5. **Category of employees** : Technical
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Hybrid development scenario of vegetables in India
	II	Heterosis breeding: classical and modern concepts/theories
	III	Mechanisms and methods for hybrid development in self-pollinated vegetable crops
	Field visit	Visit to ICAR-IIVR experimental fields facility
2	I	Mechanisms and methods for hybrid development in cross pollinated vegetable crops
	II	Heterosis, inbreeding depression and transgressive segregation
	II	Male sterility: mechanism and exploitation in vegetables
	III	Nursery management in vegetable crops
	IV	Development of hybrids and hybrid seed production of okra
	V	*Practical:* Hybridization in okra: selection of floral bud, emasculation, bagging of male/female flower etc.
3	I	*Practical:* Hybridization in okra: selection of floral bud, emasculation, bagging of male/female flower etc.
	II	Development of hybrids and hybrid seed production of gourds
	III	Maintenance methods of parental lines for pure hybrid development
	IV	Nutrient management for higher yields of hybrid
	V	*Practical: H*ybridization in cucumber and pumpkin: selection of floral bud, bagging of male/female flower etc.
4	I	*Practical: H*ybridization in cucumber and pumpkin

Day	Session	Topic/ Activity
	II	Development of hybrids and hybrid seed production of tomato
	III	Assessment of cost benefit of hybrid *vis-à-vis* open pollinated seed production in vegetable crops
	IV	*Practical: H*ybridization in gourds: selection of floral bud, bagging of male/female flower etc.
5	I	*Practical: H*ybridization in gourds
	II	Development of hybrids and hybrid seed production of brinjal
	III	Role of private sectors in vegetable hybrid technology
	IV	*Practical:* Hybridization in tomato: selection of floral bud, bagging of male/female flower etc.
6	I	*Practical: H*ybridization in tomato
	Lab visit	Visit to lab of Crop Improvement, Crop Production and biocontrol unit and Plant Protection lab
	III	*Practical:* Hybridization on brinjal: selection of floral bud, bagging of male/female flower etc.
7	I	Development of hybrids and hybrid seed production of chilli and sweet pepper
	II	Self-incompatibility for hybrid seed production in vegetable crops
	III	Hybrid development and production: under protected condition
	IV	*Practical: H*ybridization in chilli and sweet pepper: selection of floral bud, bagging of male/female flower etc.
8	I	*Practical: H*ybridization in chilli and sweet pepper
	II	Quality hybrid seed production of improved vegetable hybrids
	III	Techniques for seed health testing
	IV	Development of hybrids and hybrid seed production of cole crops
	V	*Practical: H*ybridization in cole crops: selection of floral bud, bagging of male/ female flower etc.
9	I	Development of hybrids and hybrid seed production of root crops
	II	*Theory & Practical:* Hybrid purity testing using conventional and molecular approach
	III	Integrated disease management of hybrid vegetables
	IV	Economically important viral diseases of vegetables and their integrated management
10	I	Integrated insect-pest management of hybrid vegetables
	II	Scope of hybrid developments in leguminous vegetables
	III	Development of hybrids and hybrid seed production of onion
	IV	*Practical: H*ybridization in legume vegetables

Day	Session	Topic/ Activity
11	I	Hybrid seed production in vegetable crops at the farmers field: success stories and concept of seed village
	II	Feedback of participants
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercise, demonstrations, discussions on actual problems faced, interactions and Field/Laboratory/Facility visits.

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Programme: 15

1. **Title** : **Hi-tech Propagation and Nursery Management for Production of Quality Planting Material**
2. **Organizing Institute** : ICAR-Indian Institute of Horticultural Research, Bengaluru
3. **Objective(s)** :
   - To impart basic knowledge and develop skills about propagating different types of plants by seed, cuttings, budding and grafting, separation, division, layering as well as micro-propagation in commercially viable way
   - To provide basic knowledge about tools, equipments and growing structures used in nursery for plant production
   - To impart knowledge on establishment of commercial nurseries
   - To infuse entrepreneurial skills of commercialization of nursery production
4. **Duration** : 10 days
5. **Category of employees** : Technical
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Introduction to nursery management
	II	*Theory & Practical*: Use of alternate potting media and bio-inoculants in nursery
2	I	Propagation of horticultural crops through seeds
	II	Plant propagation structures/machines
	III	*Theory & Practical*: Introduction to plant tissue culture and demonstration
3	Field/Lab visit	Visit to Tissue culture and propagation unit
4	I	*Theory & Practical*: Seed and seedling production in papaya
	II	Vegetative propagation – 1 Cuttings, layering
	III	Use of rootstocks in fruit production
5	I	Use of plant growth regulators in Nursery
	II	Nutrient management in nursery
	III	Quality seedling Production in vegetable crops
	IV	Quality Seedling Production in ornamental crops -1

Day	Session	Topic/ Activity
6	I	Quality Seedling Production in ornamental crops -2
	II	Production of virus free planting material and bud wood certification
	III	Disease management in nursery
	IV	Pest Management in Nursery
7	I	Nursery certification/Accreditation and quality assurance
	II	Shoot Tip Grafting and micro budding in Citrus
	Field visit	Visit to Botanical Garden, Lalbagh, Govt. of Karnataka / Visit experimental plots and nursery of Hirehalli, IIHR, Bengaluru
8	Field visit	Field visit to Horticulture Bio-centre, Hulimaavu, Dept. of Horticulture, Karnataka
9	I	Entrepreneurship Development through nursery (including Transport and Marketing)
	II	Recent advances in grafting of vegetable crops
	Field visit	Visit to IIHR, Nursery and Fruit Demonstration block
	Valedictory	Feedback and Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercise, demonstrations, discussions on actual problems faced, interactions and Field/Laboratory/Facility visits.

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Programme: 16

1. Title : **Use of Different Molecular Biology Techniques in Crop Improvement Programme**

2. Organizing Institute : ICAR-National Institute for Plant Biotechnology (NIPB) (formerly ICAR-NRCPB, New Delhi)

3. Objective(s) :

- To provide training on isolation of DNA, RNA and their subsequent manipulation
- To provide training in the area of amplification of genomic DNA using PCR and its subsequent applications
- To provide training in the area of plant transformation
- To provide training in the area of molecular markers and their applications

4. Duration : 02 weeks (15 days)

5. Category of employees : Technical

6. Course content (day-wise theory and practical course content):

Day	Session	Topics/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Introduction to the training program and orientation
	II	Development of plant molecular biology techniques over past three decades
	III	Role of Technical Officers and Molecular Biology Techniques in crop improvement programmes in ICAR
	IV	*Practical:* Isolation of genomic DNA from plants
2	I-II	DNA quantification and techniques commonly employed for quantification
	III-IV	*Practical:* DNA quantification using agarose gel electrophoresis and spectrophotometric analysis
3	I-II	PCR and its applications in plant molecular biology
	III-IV	*Practical:* Amplification of genomic DNA using PCR
4	I-II	*Practical:* Analysis of PCR amplified products on agrose gel and its interpretation
	III-IV	*Practical:* Analysis and troubleshoots of PCR
5	Exposure visit	Visit to various facilities at NRCPB
6	I-II	Molecular markers and their applications in plant breeding
	III-IV	*Practical:* Molecular marker analysis using SSR markers
7	I-II	*Practical:* Molecular marker analysis using CAPS and SNP markers, gel scoring and interpretation
	III-IV	Southern hybridization and its troubleshoots

Day	Session	Topics/ Activity
8	I-II	*Practical:* Agrose gel electrophoresis of restricted samples and Southern Blotting
	III-IV	*Practical:* Southern hybridization
9	I-II	Principle behind isolation and cloning of plasmid DNA
	III-IV	*Practical:* Isolation and cloning of plasmid DNA- day one
10	I-IV	*Practical:* Isolation and cloning of plasmid DNA- day two
11	I-IV	*Practical:* Isolation and cloning of plasmid DNA- day three
12	I-II	*Practical:* Principles and techniques used for isolation of plant RNA
	III-IV	*Practical:* RNA isolation
13	I-II	*Practical:* Resolution of the RNA samples on denaturing agarose gels
	III-IV	*Practical:* Expression analysis using RT-PCR
14	I-II	*Practical:* Plant transformation and its applications
	III-IV	*Practical:* Agrobacterium mediated plant transformation
15	I-II	Next generation sequencing technology: an overview
	III	Group discussion, feedback and evaluation of participants
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercise, demonstrations, discussions on actual problems faced and Laboratory/Facility visits.

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Programme: 17

1. **Title** : **Microbial Culture Handling and Maintenance**
2. **Organizing Institute** : ICAR-National Bureau of Agriculturally Important Microorganisms, Mau
3. **Objective(s)** :
   - To develop requisite competency among qualified technical staff for effective support and assistance to the scientists for management of microbiological works
   - To acquaint the technical staff with techniques of microbial conservation for sustainable use
   - To train staff for maintenance and use of microbial biofertilizer, biopesticides and biostimulants in agriculture
4. **Duration** : 10 days
5. **Category of employees** : Technical
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topics/Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Microbial techniques
	II	*Practical:* Good microbiological practices
2	I	Role of microorganisms in crop productivity and soil health
	II	Method for isolation of bacteria from difference niches and sources
	III	*Practical:* Sampling of soil, water, plant, food and their storage
	IV	Types of media and their preparation
3	I	Tools and techniques for identification of microbes
	II	*Practical:* Media preparation
	III	*Practical:* Sterilization of soil, media and other thermo-labile materials
	IV	Methods for short-term and long-term storage of microorganisms
4	I	Isolation and purification of bacteria, fungi and actinomycetes from soil and other sources
	II	Isolation and purification of bacteria Including rhizobia; fungi; actinomycetes
	III	*Theory & Practical:* Isolation of cyanobacteria and their use in crops
	IV	*Theory & Practical:* Methods of long-term preservation of microorganisms through lyophilization (freeze drying)

Day	Session	Topics/Activity
5	I	Functional characterization of bacteria and fungi for unravelling plant growth promoting attributes
	Lab visit	Visit to ICAR-NBAIM labs
	III-IV	*Practical:* Functional characterization of microbes
6	I-II	*Practical:* Lyophilisation (freeze drying)
	III-IV	*Practical:* Tools and techniques for identification of microbes
7	I	*Practical:* Preparation of slants and glycerol stock for short-term preservation of bacteria and fungi
	II	Isolation of gut microflora from brackish water shrimp
	III-IV	*Theory & Practical:* Preservation of fungi in mineral oil
8	I-II	*Theory & Practical:* Methods for cryopreservation of microorganisms
	III-IV	MPN technique for enumeration of bacteria
9	I	Observation of results of all the experiments
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercise, demonstrations, discussions on actual problems faced, interactions and Laboratory/Facility visits.

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Programme: 18

1. **Title** : **Techniques in Microbiology**
2. **Organizing Institute** : ICAR-National Bureau of Agriculturally Important Microorganisms, Mau
3. **Objective(s)** :
   - To develop competency among qualified technical staff to assist the scientist in microbiological work,
   - To impart awareness to the technical staff about techniques for isolation, purification, characterization and preservation of microorganisms and
   - To train the staff in techniques related to field evaluation of microorganisms
4. **Duration** : 02 weeks
5. **Category of employees** : Technical
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Techniques in microbiology
	Lab visit	Visit to laboratory of ICAR-NBAIM, Mau for acquaintance with microbiology labs and equipments
2	I	Sampling methods
	II	*Practical:* Sampling of plant, plant parts, soil, water, and their storage
	III	Types of media and their preparation
	IV	*Practical:* Types of media and their preparation
3	I	Isolation of MOs i.e. fungi, bacteria, actinomycetes and Cyanobacteria from soil and Rhizobium from nodule
	II	*Practical:* Isolation of MOs i.e. fungi, bacteria, actinomycetes and Cyanobacteria from soil and Rhizobium from nodule
	III	Enumeration of viable cell count of MOs
	IV	*Practical:* Enumeration of viable cell count of MOs
4	I	Purification, maintenance and preservation of microbes
	II	*Practical:* Purification, maintenance and preservation of microbes
	III	Biochemical and physiological characterization
	IV	*Practical:* Biochemical and physiological characterization

Day	Session	Topic/ Activity
5	I	*Practical:* Biochemical and physiological characterization
	II	*Theory & Practical:* Techniques for evaluation of biocontrol agents
6	I	Scanning Electron microscopy
	II	*Practical:* Preparation of samples for Scanning Electron microscopy
	III	Enumeration of viable cell count of MOs by standard plate count method or MPN technique
7	I-IV	*Practical:* Survey, soil, plant and water sample collection
8	I-IV	*Practical:* DNA isolation and PCR, Gel electrophoresis
9	I-IV	*Practical:* Data recording and analysis
10	I	Characterization of MOs for functional attributes
	II	*Practical:* Characterization of MOs for functional attributes
	III	Molecular characterization of MOs and trouble shooting
	IV	*Practical:* Molecular characterization of MOs and trouble shooting
11	I	Staining & Microscopy
	II	*Practical:* Staining & Microscopy
	III	*Practical:* Characterization of MOs for functional attributes
12	I	Biosafety
	II	IPR
	III	*Theory & Practical:* Seed priming with microbial inoculants
13	I	DNA sequencing and data analysis
14	I	Evaluation of the trainees and feedback
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercise, demonstrations, discussions on actual problems faced, interactions and Laboratory/Facility visits.

8. Programme Designed, Developed and Organized By:

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Course Co-Coordinator(s)	:	Dr. Hillol Chakdar, Scientist
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		Dr. Arjun Singh, Scientist

Programme: 19

1. **Title** : **Trace Level Analysis of Pesticides, Phytochemicals, Sugars and Organic Acids**
2. **Organizing Institute** : ICAR-Indian Agricultural Research Institute, New Delhi
3. **Objective(s)** :
   - To provide hands-on training on gas chromatographic (GC) analysis of pesticides/ phytochemicals/Nitrogenase estimation/sugars and organic acids
   - To facilitate hands-on training on liquid chromatographic (LC) analysis of pesticides/ phytochemicals/Sugars/Organic acids
   - Maintenance of GC & LC
4. **Venue** : Division of Agricultural Chemicals, IARI, New Delhi
5. **Duration** : 01 week
6. **Category of employees** : Technical
7. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Principles of chromatographic techniques
	II	Application of chromatographic techniques for separation and identification of organic molecules
	III	*Practical:* Basic Chromatographic technique (TLC and Column Chromatography)
2	I	Gas Chromatographic technique of estimation of organic compounds – principle and instrumentation with case studies
	II	*Theory & Practical:* Preparation of pesticide standards and dilution techniques
	III	*Practical:* Estimation of pesticides by GC-ECD
	IV	Principles of pesticide residue analysis
3	I	Principle of identification and quantification of phytochemicals/ pesticides by GC-MS with case studies
	II	*Practical:* Estimation of phytochemicals (curcuminoids) by HPLC- UV/PDA
	III	*Practical:* Identification and quantification of phytochemicals by GC-MS
4	I	Liquid Chromatographic technique of estimation of organic compounds – principle and instrumentation with case studies
	II	*Practical:* Nitrogenase activity estimations using GC
	III	*Practical:* Simultaneous analysis of sugars and organic acid using HPLC

Day	Session	Topic/ Activity
5	I	Principle of identification and quantification of phytochemicals/ pesticides by LC-MS/MS with case studies
	II	*Practical:* Extraction of pesticide from vegetable matrices
	III	*Practical:* Identification and quantification of pesticides by LC-MS/MS
6	I	Concepts and procedure of maintenance of LC and GC systems for smooth functioning
	II	GC/LC Instrumental requirement criteria for maintenance Quality management systems in Accredited Agrochemical laboratory
	III	Group discussion and Feedback
	Valedictory	Valedictory Programme

8. Pedagogy : Training programme consisted of lectures, practical exercise, demonstrations, discussions, interactions, case studies and Laboratory/Facility visits.

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Programme: 20

1. **Title** : **Selection, Adjustment, Operation and Maintenance of Agricultural Implements for Field and Horticultural Crops**
2. **Organizing Institute** : ICAR-Central Institute of Agricultural Engineering, Bhopal
3. **Objective(s)** :
   - To enhance the skills in machine drawing, manufacturing process calibration, adjustment, operation and maintenance of various farm implements used in field experiments as well as regular farm/orchard operations
4. **Duration** : 02 weeks
5. **Category of employees** : Technical (T-1 to T- 4)
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Pre-course evaluation & training needs of participants
	II	Agricultural Implements – An Overview
	Field visit	Visit to agricultural machinery display hall/Divisions/Centers/laboratories & other facilities
2	I	Tillage implements- Selection, adjustment and operation
	II	Plant protection equipments for Horticulture crops, their adjustment, repairing and field operation
	III	*Practical*: Field operation and maintenance of selected tillage implements
	IV	*Practical*: Plant protection equipments, their adjustment, repairing and field operation
3	I	Selection of seeding, planting machinery and their adjustment, operation and maintenance
	II	Testing for standardization and quality control of agricultural machinery
	III	*Practical*: Field operation and maintenance of selected seeding, planting machinery and vegetable transplanter
	IV	*Practical*: Testing for standardization and quality control of agricultural machinery
4	I	Introduction of conservation machinery, their adjustment and field operation
	II	Introduction to rice transplanting machinery
	III	*Practical*: Conservation machinery, their adjustment and field operation

Day	Session	Topic/ Activity
	IV	Field operation and maintenance of rice transplanters
5	Exposure visit	Educational visit to ITC choupal, Vidisha and Sanchi
6	I	Selection of harvesting and threshing machinery, their adjustment, repairing and maintenance; Power tiller operation & matching equipment and horticulture machinery
	II	*Practical*: Harvesting and threshing machinery, their adjustment, repairing and maintenance
	III	*Practical*: Small tractor / Power tiller operation & matching equipment and horticulture machinery
7	I	Women friendly technologies and ergonomics & safety considerations in agricultural machinery
	II	An overview of modern processing machinery & technologies
	III	Women friendly technologies and ergonomics & safety considerations in agricultural machinery
	IV	Demonstration of processing machinery
8	I	Protected cultivation for field & horticultural crops- Theory & field demonstration
	II	*Theory & Practical:* Feed processing technology for livestock management
9	I	Modern energy gadgets and their performance
	II	Use of solar energy in Agriculture
	III	*Practical*: Modern energy gadgets and their performance
	IV	*Practical*: Hands on training of Biomass management
10	Exposure visit	Visit to EICHER tractor company, Mandideep & CFMTTT, Budhni
11	I	IPR issues in agriculture and awareness
	Exposure visit	Exposure visit to IISS, Bhopal
	III	Field plot machinery for various crops and Horticulture tools and their adjustment, operation and maintenance
12	I	Decision support system for estimating operating cost of agricultural machines and custom hiring of agricultural machinery
	II	*Practical:* Hands on training on Soy Products
13	I	Post-evaluation, presentations & feed-back from participants & discussion
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercise, demonstrations, discussions on actual problems faced, interactions, and Field/Lab/Exposure visits.

8. Programme Designed, Developed and Organized By:

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Programme: 21

1. **Title** : **Operation and Maintenance of Improved Implements and Machinery**
2. **Organizing Institute** : ICAR-Central Institute of Agricultural Engineering, Bhopal
3. **Objective(s)** :
   - To develop the skills in calibration and adjustment of various farm implements used in field experimentation
   - To enhance the skills in operation and maintenance of various farm implements used in field experimentation
4. **Duration** : 01 week
5. **Category of employees** : Technical (T-1 to T- 4)
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Pre-course evaluation & training needs of participants
	II	Agricultural Implements – An Overview
	Field visit	Visit to agricultural machinery display hall/ Divisions/Centres/ laboratories & other facilities
2	I	Tillage implements- Selection, adjustment and operation
	II	*Practical:* Field operation and maintenance of selected tillage implements
	III - IV	*Practical:* Plant protection equipments, their adjustment, repairing and field operation
3	I	Selection of seeding, planting machinery and their adjustment, operation and maintenance
	II	Testing for standardization and quality control of agricultural machinery
	III - IV	*Practical:* Testing for standardization and quality control of agricultural machinery
4	I	Introduction to rice transplanting machinery
	II	*Practical:* Preparation of nursery for rice transplanting machinery
	III - IV	*Practical:* Field operation and maintenance of rice transplanters
5	I	Selection of harvesting and threshing machinery, their adjustment, repairing and maintenance
	II	*Practical:* Harvesting and threshing machinery, their adjustment, repairing and maintenance

Day	Session	Topic/Activity
	III - IV	*Practical:* Operation and adjustments in combine harvester
6	I	Women friendly technologies and ergonomics & safety considerations in agricultural machinery
	II	Women friendly technologies and ergonomics & safety considerations in agricultural machinery
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercise, demonstrations, discussions on actual problems faced, interactions, and Field/Lab/Exposure visits.

8. Programme Designed, Developed and Organized By:

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Er. D. K. Dwivedi, Chief Technical Officer
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Programme: 22

1. **Title** : **Food Processing, Packaging and Value Addition of Agricultural and Livestock Produce**
2. **Organizing Institute** : ICAR-Central Institute of Post-Harvest Engineering & Technology, Ludhiana
3. **Objective(s)** :
   - To inculcate knowledge of type of processing, post-harvest operations and different unit operations involved in food processing
   - To conduct hands-on-experience practical using different machinery, tools and process protocols for value addition of agricultural and livestock produce
4. **Duration** : 02 weeks
5. **Category of employees** : Technical
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Showcasing of CIPHET developed technologies
	II	Concept of Agro Processing Centre - Practical exposure
	III	Post-Harvest Machinery Testing Centre - Practical exposure
2	Exposure visit/ Practical	Visit to Punjab Agricultural University *Practical:* Handling and maintenance of Honey Processing Machinery, pectin plant GADVASU LPT Poultry Processing, LPT Product Development Lab
3	I	Importance and types of processing, unit operations in post-harvest, food processing and value addition
	II	*Practical:* Estimation of engineering properties of agricultural produce
	III	*Practical:* Milling operations in food grains
	IV	Packaging material handling and testing techniques
	V	*Practical:* Demonstration & operation of primary processing machinery including dryers
4	I	*Practical:* Maintenance of Argo-processing machineries
	II	*Practical:* Handling and operation of pulse milling machinery
	III	*Practical:* Handling and operation of extruder
	Exposure visit	Visit to GADVASU (Dairy Processing Plant, Dairy Engineering, Dairy Technology Laboratory)

Day	Session	Topic/Activity
5	I	*Practical:* Value addition of cereals
	II	*Practical:* Modern technique of Makhana Processing & Value addition
	III	*Practical:* Preparation of a value-added product from cereals
	IV	*Practical:* Testing, repair and maintenance of agro processing machinery
6	I	*Practical:* Handling and maintenance of Honey processing machinery
	II	*Practical:* Processing of Pulses; masoor, chana in APC
	Field visit	Cold Chamber Operations and maintenance, PHPTC PAU Ludhiana
7	I	Minimal Processing and packaging of fruits and vegetables
	II	*Practical:* Packaging of Fruits and Vegetables
	III	*Practical:* Cryogenic grinding of spices
	IV	*Practical:* Spice processing (Turmeric, coriander & Chilli)
8	I	Preparation of value added products from fruits and vegetables
	II	*Practical:* Processing and value addition of Green Chilli
	III	*Practical:* Processing and value addition of tomato
	Field visit	Visit to Minimal Processing and Packaging unit, Field Fresh, Ludhiana
9	I	*Practical:* Extraction techniques from Livestock waste
	II	*Practical:* Processing of meat into value added product
	III	*Practical:* Laboratory methods for estimation of food properties
	IV	*Practical:* Processing and canning of fish product
10	I	Drying of agriculture produce
	II	*Practical:* Preparation of soya milk, groundnut milk & paneer
	III	*Practical:* Preparation of fruit pulp into value added product
	IV	*Practical:* Handling and Operation of different dryers including spray dryer
11	I	*Practical:* Estimation of colour and textural properties of fruits
	II	*Practical:* Calibration of laboratory weighing balance, pH meter
	III	*Practical:* Operation of sophisticated laboratory equipment's
	IV	*Practical:* Handling and Operation of oil milling machinery
12	I	Participants presentation and discussion
	II	Feedback from Participants
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercise, demonstrations, discussions on actual problems faced, interactions, participants' presentation and Field/ Lab/Exposure visits.

8. Programme Designed, Developed and Organized By:

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Programme: 23

1. **Title** : **Basic Training on Routine Chemical Analysis**
2. **Organizing Institute** : ICAR-National Dairy Research Institute, Karnal
3. **Objective(s)** :
   - To make up the skill deficiency of the technical staff
   - To impart basic orientation to the technical staff for routine operations in a chemistry laboratory
   - To provide exposure to usage and maintenance of different instruments in lab
4. **Venue** : Dairy Chemistry Division, NDRI, Karnal
5. **Duration** : 01 week
6. **Category of employees** : Technical
7. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	Exposure visit	Visit to Dairy Chemistry Division/Referral lab
	II	Good lab practices: Rules of handling reagents and solutions, standard operating procedures
	III	*Practical:* Analytical balance and weighing practices
2	I	Laboratory documentation & safety aspects (Referral Laboratory)
	II	*Practical:* Use of pipettes/syringes-Accuracy vs. Precision; separating funnels and desiccators
	III	*Practical:* Use of burettes and preparation of standard solutions
	IV	*Practical:* pH meter and maintenance of electrode; filtration and distillation of solvents
3	I	*Practical:* Use/maintenance of Drying oven, Muffle furnace, water bath, water still and butyro refractometer
	II	*Practical:* Use / maintenance of centrifuges and freeze driers
	Field Visit	Visit to ATIC/TBI/LRC
	IV	*Practical:* Calibration of glassware and cleaning of glassware

Day	Session	Topic/ Activity
4	I	*Practical:* Use / maintenance of water purification system, Ultra sonicator, membrane filtration unit and Kjeldahl nitrogen unit
	II	*Practical:* Preparation of sample and general aspects of GLC
	III	*Practical:* Preparation of sample and general aspects of AAS
	IV	*Practical:* Preparation of sample and general aspects of HPLC
5	I	*Practical:* Use / maintenance of Spectrophotometer (Single beam, double beam)
	II	*Practical:* Use / Maintenance of different lab instruments
	Exposure Visit	VISIT TO EBRO lab/NABL lab (Tarawari)
6	I	*Practical:* Testing of milk fat & SNF
	Exposure Visit	Visit to Karnal based ICAR sister Institutes
	Valedictory	Feedback & Valedictory Programme

8. Pedagogy : Training programme consisted of lectures, exercise, demonstrations, discussions on actual problems faced, interactions, experience sharing and site visits.

9. Programme Designed, Developed and Organized By :

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Programme: 24

1. **Title** : **Handling and Care of Laboratory Animals**
2. **Organizing Institute** : ICAR-National Dairy Research Institute, Karnal
3. **Objective(s)** :
   - To acquaint with general aspects of handling and care of Laboratory Animals
   - To train the technical staff for enriching their management skills of laboratory animals according to the animal welfare norms
4. **Venue** : Animal Biochemistry Division, NDRI, Karnal
5. **Duration** : 01 week
6. **Category of employees** : Technical
7. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Orientation of Training Programme
	II	Introduction to small animal experimental house
	III	General laboratory practices in small animal house
	Field visit	Visit to small animal house
2	I	Different species of common laboratory animals
	II	Basic precautions to handle laboratory
	III	*Practical:* Demonstration of handling lab animals
	IV	*Practical:* Hands on handling lab animals by participants
	V	Receiving, quarantine and grouping of lab animals
3	I	*Practical:* Blood collection of laboratory animals
	II	*Practical:* Dissection of rats and mice
	III	*Practical:* Demonstration of dissection of mice/rat
	IV	*Practical:* Hands on dissection of rat/ mice by participants
	V	Handling methods of dissected tissues and disposal of carcass

Day	Session	Topic/ Activity
4	I	Introduction to CPCSEA & IAEC
	II	Importance of different animal feed, preparation of experimental animal feed, feeding and watering of laboratory animals
	III	*Practical:* Demonstration of feeding and watering animals
	IV	Feed handling and storage practices
	V	Health care of laboratory animals
5	I	R3 & Alternatives
	II	Common diseases in laboratory animals & sick animal management
	III	Common drugs used in laboratory animals
	IV	Breeding of laboratory animals & management of laboratory animals
6	I	Discussion and Feedback
	Valedictory	Valedictory Programme

8. Pedagogy : Training programme consisted of lectures, practical exercise, demonstrations, discussions on actual problems faced, interactions, and Field/Lab visits.

9. Programme Designed, Developed and Organized By :

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Programme: 25

1. **Title** : **Reproductive Health Management of Dairy Animals**
2. **Organizing Institute** : ICAR-National Dairy Research Institute, Karnal
3. **Objective(s)** :
   - To provide an exposure to the technical staff of ICAR about recent developments in area of reproductive health management
   - To upgrade the knowledge and skill to improve the fertility in dairy animals
4. **Venue** : Livestock Production Management Section, NDRI, Karnal
5. **Duration** : 01 week
6. **Category of employees** : Technical
7. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	Field visit	A visit to Livestock Research Centre
	I	Nutrition of Cattle & Buffalo for optimum reproduction
2	I	*Practical:* Study of female genitelia in slaughter house specimen
	II	Therapeutic management of post-partum infection in Cattle & Buffaloes
	III	Measures to improve conception rate in cattle and buffaloes
	IV	Recent methods for estrus detection
3	I	*Practical:* Estrus detection and artificial insemination of cattle & Buffaloes
	II	Therapeutic management of infertility in cattle & buffaloes
	III	Management of breeding bulls
	IV	Importance of dietary protein in reproductive performance in dairy animals
4	Exposure visit	Visit to Om dairy and breeding farm, Panipat (Haryana)
	II	Transition cow management
	III	Salivary ferning, a new tool of estrus determination in buffaloes
5	I	*Practical:* Ultrasonic evaluation of female reproductive tract for estrus detection & pregnancy
	II	Role of Zinc in Soil-Plant-Livestock Continuum & its fortification in fodder crop to enhance reproduction performance
	III	Advanced reproductive technologies for animal multiplication & genetic improvement

Day	Session	Topic/ Activity
	IV	*Practical: In vitro* embryo production
6	Field visit	Visit of ABRC facility for semen processing
	II	Advances in cryo-preservation process and improvement of semen quality
	III	Dry cow management for optimum reproduction
	IV	*Practical: In vitro* embryo production
7	I	Breeding soundness evaluation of bulls
	II	Quality semen production
	Valedictory	Valedictory Programme

8. Pedagogy : Training programme consisted of lectures, practical exercise, demonstrations, discussions, interactions, and Field/Lab/Exposure visits.

9. Programme Designed, Developed and Organized By :

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Programme: 26

1. **Title** : **Dairy Farm and Milk Processing Plant Management**
2. **Organizing Institute** : ICAR-National Dairy Research Institute, Karnal
3. **Objective(s)** :
   - Capacity building of the technical staff and Subject Matter Specialists (SMS) working in animal science Institutes, KVKs and in various areas of dairy farming, quality milk production, milk supply chain, quality testing of raw milk, value addition, processing and packaging of dairy products
   - Providing "Hands-on Training" for effective management of dairy farm and processing plants.
4. **Venue** : BPD Unit, Dairy Technology Division, NDRI, Karnal
5. **Duration** : 02 weeks
6. **Category of employees** : Technical and Subject Matter Specialists (SMS) of KVK
7. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Advance dairy farming practices an overview, its importance in commercial dairy farming
	II	Breeds and breeding: i) Selection criteria for animals, ii) concept of inheritance, culling criteria's ii) Multiplication of superior germplasms through efficient breeding practices
	III	*Practical:* Correct procedures for storage /handling of semen doses. Sexed semen availability and uses
	IV	Importance of Semen handling for animals fertility at commercial dairy farming
	V	National Code of Practices for management of dairy animals in India including Animal welfare and ethical issues associate with dairy animals
2	I	*Practical:* Reproductive health issues, its identification and prevention Advancement in reproductive health management, synchronization and set time AI techniques, its practical utility for commercial dairy farms
	Field visit	Visit to Livestock Research Centre of NDRI: Modern Housing designs, its dimensions. Advantages and limitations of different housing designs
	Field visit	Visit to NDRI Fodder Farm**:** Fodder production and new high yielding/multi cut fodder crops for commercial dairy farming, strategies for round the year fodder production
	IV	Use of mineral supplements and preparation of simple mineral supplements mixture by the trainees

Day	Session	Topic/Activity
3	I	*Theory & Practical*: Managing animal health, common diseases of dairy animals, Vaccination of animals, veterinary first aid techniques
	II	*Theory & Practical*: Applications of newer feed supplements (Protected amino acids, protected fats, rumen bypass proteins, chelated minerals, feed detoxification agents etc) and their uses in feed making. Balancing of ration formulation, use of computer (excel spread sheets, software etc.) in ration formulation and complete feed formulation with special reference to growing animals
	III	*Theory & Visit*: Different types of silage storage structure, their dimensions and newer techniques for silage and hay making
4	I	*Practical :* Software's for dairy farm herd management (data recording and evaluation for herd management)
	II	*Practical :* Dairy Business management, Key performance indicators and its importance in dairy farm business management and preparation of project feasibility report
	III	Goat farming practices
	IV	Newer development in silage bailing: vacuum silage & microbial inoculants as additives
	V	*Practical:* Common health issues its identification and practices for its prevention. Advancement in udder health management and its practical utility for commercial dairy farms
5	Exposure visits	Visit to a Modern Dairy farm, Demonstration of waste utilization of dairy farms, Vermi-composting units and its functioning
6	I	Milk procurement, reception and quality assurance
	II	*Practical:* Milk procurement, reception and quality assurance
	III	Value addition and processing of milk: An overview
	IV	Overview: Technological aspects of Cheese and fermented milk
7	I	Traditional Indian dairy products: Status and scope *Practical:* Manufacturing selected traditional dairy products
	II	Total Quality Management: Concept and application in dairy plant
	III	Maintenance of dairy equipments
8	I	*Theory & Practical:* CIP in dairy industries
	II	Overview: Dairy plant management and maintenance
	III	Standards and regulations for dairy industry in India

Day	Session	Topic/Activity
9	I	Technology of fat rich dairy products: An overview
	II	*Practical:* Manufacturing selected fat rich dairy products
	III	Overview: Condensed and dried milk products
	IV	*Theory & Practical:* Effluent treatment
	V	Microbiological quality of raw milk and milk products
	VI	Food hygiene, personnel hygiene and plant hygiene
10	Exposure visit	Visit to a commercial dairy plant
	II	Feedback of participants and discussion
	Valedictory	Valedictory Programme

8. Pedagogy : Training programme consisted of lectures, practical exercise, demonstrations, discussions on actual problems faced, interactions, and Field/Lab/Exposure visits.

9. Programme Designed, Developed and Organized By :

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Programme: 27

1. **Title** : **Technology Management and Business Planning for Entrepreneurship Development**
2. **Organizing Institute** : ICAR-National Dairy Research Institute, Karnal
3. **Objective(s)** :
   - To impart basic foundation to practical aspects related to technology management, business planning skills and entrepreneurship development skills to the participants
   - To acquaint with related aspects of technology management, business planning and entrepreneurship development
4. **Venue** : Dairy Extension, National Dairy Research Institute : Southern Regional Station (SRS), Bengaluru
5. **Duration** : 01 week
6. **Category of employees** : Technical Officers
7. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Training brief up and ice breaking session
	II	Agri-Entrepreneurship development - An Overview
	III	Interactive session with trainees about technology commercialization
2	I	Basics of technology management and business plan preparation
	II	Dairy processing entrepreneurship SRS, ICAR-NDRI Experience
	III	Agri -Value Chain Analysis: An overview
	IV	Identification of entrepreneurial competencies
3	Field Exposure visit	Technology commercialization through Agri-business incubators : ICAR-IIHR experiences Field Exposure Visits to ICAR-IIHR :ITMU - Successful Agro-Business Units
4	I	Intellectual Property Rights (IPR) in Agro-Technology Management
	II	Market Survey techniques for technology commercialization
	III	Food Processing : Make in India
	IV	Idea/Opportunity identification–Group exercises

Day	Session	Topic/ Activity
5	I	Data base and business forecasting
	II	ICAR guidelines for professional service/Consultancy functions
	III	Preparation of Business plan- Basics and case study exercises
	IV	Regulatory issues and food laws
6	I	Experience sharing by successful entrepreneur
	II	Presentation by trainees on innovative Agro-business plans
	III	Feed Back & training evaluation
	Valedictory	Valedictory Programme

8. Pedagogy : Training programme consisted of lectures, group exercise, experience sharing of successful entrepreneur, discussions, interactions, and Field/Exposure visits.

9. Programme Designed, Developed and Organized By :

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Programme: 28

1. **Title** : **Good Laboratory Practices in Animal Science**
2. **Organizing Institute** : ICAR-National Dairy Research Institute, Karnal
3. **Objective(s)** :
   - To acquaint the participants with the principles and overview of Good Laboratory Practices
   - To provide hands-on-practical training to the participants on Good Laboratory Practices applicable to Chemistry and Microbiology laboratory in agricultural research.
4. **Venue** : National Dairy Research Institute : Southern Regional Station (SRS), Bengaluru
5. **Duration** : 01 week
6. **Category of employees** : Technical
7. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Good Laboratory Practices – An overview
	II	Laboratory protocol for microbiological analysis
	III	*Practical:* Preparation of reagents and standard solutions
2	Exposure visit	Visit to Plant LRC and Dairy Plant
	II	*Practical:* Milk and dairy products microbiological analysis
	III	*Practical:* Calibration of laboratory glassware
	IV	*Practical:* Milk and dairy products chemical composition analysis
	VI	*Practical:* Milk and dairy products microbiological analysis
3	I	Minimum standard protocols for semen quality evaluation
	II	*Theory and Practical:* Application of software and statistical tools for laboratory results interpretation
	III	IPR protocols in agricultural research laboratory
	IV	Application of new generation analytical techniques
	V	General safety protocols in the laboratory
4	I	Laboratory Accreditation-Practical approach
	Exposure visit	Visit to NABL Accredited laboratory

Day	Session	Topic/ Activity
5	I	GLP in molecular genetics
	II	New generation dairy food process engineering techniques
	III	*Practical:* GLP in chromatography techniques
	IV	*Practical:* Sensory evaluation techniques
	V	Lean laboratory techniques
6	I	Animal disease diagnostic tools
	II	*Practical:* Documentation and standard operating procedure in laboratory
	IV	Quality Assurance in a Food laboratory
	Valedictory	Feedback and Valedictory Programme

8. Pedagogy : Training programme consisted of lectures, practical exercises, demonstrations, discussions, interactions, and Plant/Exposure visits.

9. Programme Designed, Developed and Organized By :

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Programme: 29

1. **Title** : **Precision Instrumentation in Dairy Research and Food Quality Evaluation**
2. **Organizing Institute** : ICAR-National Dairy Research Institute, Karnal
3. **Objective(s)** :
   - To acquaint the participants with importance of food quality analysis
   - To acquaint the participants with precision instrument usage and application in the quality analysis of dairy foods and dairy research.
4. **Venue** : National Dairy Research Institute : Southern Regional Station (SRS), Bengaluru
5. **Duration** : 01 week
6. **Category of employees** : Technical
7. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Spectrophotometric analysis
	II	*Practical:* Spectrophotometry-Sample preparation, calibration and analysis
	III	Chromatography: Principles and application
	IV	*Practical:* Chromatography: Sample preparation and analysis protocol
2	I	Molecular Techniques: PCR Principles & application
	II	Molecular Techniques: Gel Electrophoresis Principles & application
	III	GCMS- Industry
	IV	ICP-OES theory and sample analysis
3	I	New generation analytical techniques in assessment of food quality
	II	Infrared thermography, image analysis and rheological testing of foods.
	III	Rheological testing of food
	IV	*Practical:* Hands on Training on Texture Analyzer
4	I	Introduction to PCR, sample preparation
	II	*Practical:* PCR Technique- Hands on training
	III	HPLC sample preparation and solvents
	IV	HPLC analysis of samples

Day	Session	Topic/ Activity
5	I	Antibiotic residues detection methods
	II	ELISA technique demonstration
	III	Pesticides residues & antibiotics detection
	IV	Use of imaging as a tool in analysis
6	Exposure visit	Visit to M/s Waters India Pvt. Ltd., Peenya, Bangalore
	Valedictory	Feedback and Valedictory Programme

8. Pedagogy : Training programme consisted of lectures, practical exercises, demonstrations, discussions on actual problems faced, interactions, and Lab/Exposure visits.

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Programme: 30

1. **Title** : **Commercial Dairy Production**
2. **Organizing Institute** : ICAR-National Dairy Research Institute, Karnal
3. **Objective(s)** :
   - To acquaint the participants with knowledge in principles, planning and technical approach for establishing commercial dairy farms.
   - To acquaint the participants about Regulations and Standards for Commercial Dairy Products
4. **Venue** : National Dairy Research Institute : Southern Regional Station (SRS), Bengaluru
5. **Duration** : 01 week
6. **Category of employees** : Technical
7. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Indigenous cattle and buffalo for commercial dairy farming
	II	Interaction with equipment manufacturer
	III	Dairy farming scenario
2	I	Dairy cattle selection
	II	Least cost feed formulation
	III	Utilization of alternate feed and fodder resources
	IV	Advances in dairy animal health Care
3	I	Business planning-start your entrepreneurship journey
	II	Strategies for improving reproductive efficiency
	III	Shelter management
	Field visit	Visit to LRC-Demo on CMP & Vermi-composting
4	Field visit	Visit to organized dairy farm
	II	Experiences of dairy entrepreneur
	III	Precision dairy farming

Day	Session	Topic/ Activity
5	I	Application of ultra-sonography
	II	Economics of dairy farming
	III	Dairy industry in India
	IV	Value addition to milk
	V	Regulations and standards for commercial dairy products
6	I	ICT tools for dairy farming
	II	Dairy entrepreneurship in India
	III	Dairy entrepreneurship development scheme
	Valedictory	Feedback & Valedictory Programme

8. Pedagogy : Training programme consisted of lectures, exercises, demonstrations, discussions on actual problems faced, interactions, and Farm/Exposure visits.

9. Programme Designed, Developed and Organized By :

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Programme: 31

1. **Title** : **Handling and Maintenance of Lab and Field Equipments of Fisheries Science**
2. **Organizing Institute** : ICAR-Central Institute of Fisheries Education, Mumbai
3. **Objective(s)** :
   - Upgrading and updating recent knowledge and skill of technical staffs of ICAR on handling, maintenance of lab and field instruments in Fisheries Science
4. **Duration** : 02 week
5. **Category of employees** : Technical
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Pre-training evaluation of participants
	II	Over view of basic instruments used in fish nutrition biochemistry and physiology research
	III	*Theory & Practical:* Handling and maintenance of Micro-Kjeldahl apparatus
2	I	*Theory & Practical:* Spectrophotometer-Application, handling and maintenance
	II	*Theory & Practical:* Soxtec apparatus - Application, handling and maintenance
3	I	*Theory & Practical:* Fibertech apparatus - Application, Handling and maintenance
	II	*Theory & Practical:* Centrifuge - Application, handling and maintenance
4	I	*Theory & Practical:* Sterilization equipments- Application, handling and maintenance
	II	*Theory & Practical:* Refrigeration equipments used in Fisheries research
5	I	*Theory & Practical:* Blood chemistry analyzer- Application, handling and maintenance
	II	*Theory & Practical:* Instruments related with soil and water quality parameter- Application, handling and maintenance
6	Exposure visit	Visit to research vessel MV Saraswati
7	I	*Theory & Practical:* GC-MS- Application, handling and maintenance
	II	*Theory & Practical:* HPLC- Application, handling and maintenance
8	I	*Theory & Practical:* Automated microbial identification system (VITEK) -Application, handling and maintenance
	II	*Theory & Practical:* Electrophoretic and ELISA –Application, Handling and maintenance

Day	Session	Topic/ Activity
9	I	*Theory & Practical:* Microscopy
	II	*Theory & Practical:* CHNS analyzer
	III	*Theory & Practical:* Microtomy- Application, handling and maintenance
10	I	*Theory & Practical:* PCR/RT PCR-Application, handling and maintenance
	II	*Theory & Practical:* Microarray, Gel Doc and Nano-drop - Application, handling and maintenance
11	I	*Theory & Practical:* Fish farm Instruments -Application, handling and maintenance
	II	*Theory & Practical:* Machineries for fish feed preparation
	III	*Theory & Practical:* Fish feed preparation
12	Exposure visit	Visit to local landing centers for different craft and gear (fish catching instruments)
13	I-II	Presentation by participants
	III	Post training Assessment of the participants
	Valedictory	Feedback & Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercises, demonstrations, discussions on actual problems faced, interactions, participants' presentation and Field/ Lab/Exposure visits.

8. Programme Designed, Developed and Organized By :

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Programme: 32

1. **Title** : **Good Laboratory Practices in Fisheries Science**
2. **Organizing Institute** : ICAR-Central Institute of Fisheries Education, Mumbai
3. **Objective(s)** :
   - To acquaint the participants with the principles and overview of Good Laboratory Practices in Fisheries Sciences
   - To provide hands-on-practical training to the participants on Good Laboratory Practices
4. **Duration** : 01 week
5. **Category of employees** : Technical
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Pre-training evaluation test
	Lab visit	Visit to different laboratories of ICAR-CIFE
2	I	Good Laboratory Practice (GLP) - An overview
	II-III	*Theory & Practical:* GLP- Molecular Biology Laboratory
	IV	*Theory & Practical:* Biohazard handling of hazardous chemicals
3	I	*Theory & Practical:* RNA techniques, handling and precautions
	II-III	*Theory & Practical:* Handling & operation of common lab equipments
	IV	*Theory & Practical:* GLP-Cell culture Laboratory
4	I-II	*Theory & Practical:* GLP- Molecular Diagnostic Laboratory Sample Collection and preparation Sample storage Working with nucleic acid
	III-IV	*Theory & Practical:* GLP- Molecular Diagnostic Laboratory PCR & Post-PCR
5	I-II	GLP- Immunodiagnostic Laboratory
	Field visit	Field visit (Export Inspection Agency laboratory)
6	I-II	*Theory & Practical:* GLP-Microbiology Laboratory
	III-IV	Theory & Practical: Media Preparation & sterilization Calibration of Pipettes

Day	Session	Topic/ Activity
7	I	Theory & Practical: Waste disposal in microbiology lab Working with laminar airflow, autoclave
	II	Theory & Practical: Use & maintenance of spectrophotometer, pH meter Storage of culture at -80°C
	Valedictory	Feedback & Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercises, demonstrations, discussions, interactions, and Field/Lab/Exposure visits.

8. Programme Designed, Developed and Organized By :

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Programme: 33

1. **Title** : **Microbiological Examination of Seafood**
2. **Organizing Institute** : ICAR-Central Institute of Fisheries Technology, Cochin
3. **Objective(s)** :
   - To build capacity of Technical Staff in microbiological testing of seafood
   - To acquainting advance techniques in the microbiology
4. **Duration** : 01 week
5. **Category of employees** : Technical
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Introduction to techniques in the microbiology
	II	Safety issues related to seafood
	III	*Theory & Practical*: Sterilization techniques, Enumeration techniques and Media preparation
2	I	*Theory & Practical*: Sampling of fish for microbial quality
	II	*Theory & Practical*: Plating techniques
	III	Inoculation for MPN method, surface and pour plating method
	IV	*Theory & Practical*: Staining methods, Microscopy, Motility test, Biochemical tests
3	I	*Theory & Practical*: Counting of TPC plates. Counting VRBGA,T7 plates, T7 colonies to EMB agar, Baird Parker agar, TCBS etc. (seafood borne pathogens)
	II	*Theory & Practical*: Preparation for API method of biochemical identification (API 20E, API20NE and others)
	III	Study on test results of biochemical test
	IV	*Theory & Practical*: *V. parahemolyticus* in APW-24 hr. to TCBS plates or any other target organism
4	Exposure visit	Educational visit to other Institutes in Cochin and around
5	Field/Exposure visit	Visit to Fish Processing Centers, Fish Landing Centers and other R&D organization having bearing on Fisheries development
	II	*Theory & Practical*: Counting of TPC, BP, KF plates 48h
	III	*Theory & Practical*: IMViC media for *E. coli* confirmation, Biochemical tests for confirmation of *V. parahemolyticus*.
	IV	Application of computer in Microbiology and Bioinformatics

Day	Session	Topic/ Activity
6	I	*Theory & Practical*: Techniques involved in the molecular confirmation, PCR techniques or microbial studies
	II	*Theory & Practical*: Introduction to 16s rDNA sequencing and PCR Techniques
	III	*Theory & Practical*: Techniques for Quantification of DNA
	Valedictory	Feedback & Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercises, demonstrations, discussions, interactions, and Field/Lab/Exposure visits.

8. Programme Designed, Developed and Organized By :

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Programme: 34

1. **Title** : **Computer Application**
2. **Organizing Institute** : ICAR-Indian Agricultural Statistics Research Institute, New Delhi
3. **Objective(s)** :
   - To familiarize the participants with the use and applications of computer in agriculture
   - To help in upgrading the computer skills of the participants under NARES
4. **Duration** : 01 week
5. **Category of employees** : Technical
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Introduction to ICT Applications in Agriculture
	II	Data management using MS Excel
	III	*Practical:* Data management using MS Excel
2	I	ICAR-ERP (MIS-FMS System)
	II	*Practical:* ICAR-ERP (MIS-FMS System)
	III	Statistical computing
	IV	ICAR Research data repository for knowledge management
3	I	MS Power point
	II	*Practical:* MS Power point
	III	IASRI - IT applications for NARES
	IV	IASRI - IT applications for NARES
4	I	Database Management System using MS Access, SQL server etc.
	II	*Practical:* Database Management System using MS Access, SQL server etc.
	III	Web content management tool: HTML, CSS etc, Expert Systems
	IV	*Practical:* Web content management tool: HTML, CSS etc and Expert Systems
5	I	Open Source Technology
	II	*Practical:* Open Source Technology
	III	Website creation using open source tools, Website administration and Publishing
	IV	*Practical:* Website creation using open source tools, Website administration and Publishing

Day	Session	Topic/Activity
6	I	Unified Communication System
	II	*Practical:* Unified Communication System
	III	Interaction with faculty & Feedback session
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercise, discussions on actual problems faced, interaction and Lab/Facility visits.

8. Programme Designed, Developed and Organized By:

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Programme: 35

1. **Title** : **Networking: Basics and Management**
2. **Organizing Institute** : ICAR-Indian Agricultural Statistics Research Institute, New Delhi
3. **Objective(s)** :
   - To familiarize the participants with detecting, diagnosing and resolving network performance issues
   - To familiarize the participants with latest knowhow on computer networking
4. **Duration** : 01 week
5. **Category of employees** : Technical
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Overview of Computer Networks
	II	Designing and developing a Computer Network: Issues and Challenges
	III	True Networks (LAN, WAN, MAN)
	IV	Network layout and topology
2	I	Layers and protocols (TCP/IP model)
	II	OSI Reference model
	III	Network devices
	IV	Designing a local area network
3	I	Application layer (HTTP, FTP, SMTP, POP)
	II	Network services through data center
	III	Network administration and management
	IV	Client side architecture/configuration
4	I	High performance computing
	II	IPv4/Ipv6
	III	Server side architecture/configuration
5	I	Domain name server
	II	Network security
	III	Network binding with server
	IV	Java configuration and add-ons for ICAR-ERP

Day	Session	Topic/Activity
6	I	Unified Communication
	II	Lync and Outlook Configuration
	Valedictory	Feedback and Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, exercise, discussions on actual problems faced, interaction and Lab/Facility visits.

8. Programme Designed, Developed and Organized By:

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Programme: 36

1. **Title** : **Experimental Data Analysis**
2. **Organizing Institute** : ICAR-Indian Agricultural Statistics Research Institute, New Delhi
3. **Objective(s)** :
   - To familiarize the participants with the experimental designs and statistical techniques for analysis of data for making valid inferences from their agricultural research
   - To acquaint the participants with the use of statistical software packages for data analysis
   - To help in upgrading the analytical skills of the participants under NARES
4. **Duration** : 02 weeks
5. **Category of employees** : Technical
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Descriptive Statistics
	II	*Practical*: Descriptive statistics
	III	MS Excel: Introduction
2	I	Elementary Data analysis
	II	MS Excel: Presentation features and statistical functions
	III	MS Excel: Data analysis
	IV	SPSS: Introduction
3	I	Presentation of Data: Tables and reports
	II	Presentation of Data: Tables and reports
	III	Testing of hypothesis
	IV	*Practical*: Testing of hypothesis using SPSS
4	I	Analysis of covariance
	II	Graphical representation of data
	III	Graphical representation of data
	Exposure visit	Visit to Library/ ASHOKA
5	I	SAS: An introduction
	II	*Practical*: Descriptive statistics using SAS
	III	*Practical*: Testing of hypothesis using SAS
	IV	Midterm Appraisal and feedback

Day	Session	Topic/Activity
6	I	Correlation and regression
	II	*Practical*: Correlation and regression
	III	Planning and designing of experiments
	IV	Basic experimental designs
7	I	*Practical*: Basic experimental designs
	II	Transformation of data
	III	*Practical*: Transformation of data
	IV	Case studies
8	I	Factorial Experiments
	II	*Practical*: Factorial Experiments
	III	Case studies
	IV	Response surface designs
9	I	Split and strip plot designs
	II	*Practical*: Split and strip plot designs
	Exposure visit	Visit to National Agricultural Science Museum
10	I-II	R software
	III	Information systems on designed experiments
	IV	Feedback & evaluation
11	I	Groups of experiments
	II	Web resources on designed experiments
	III	Faculty Interaction
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercise, case studies, discussions on actual problems faced, interaction and Exposure/Facility visits.

8. Programme Designed, Developed and Organized By:

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Course Coordinator : Dr. B. N. Mandal, Senior Scientist
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Programme: 37

1. **Title** : **Statistical Techniques for Agricultural Data Analysis**
2. **Organizing Institute** : ICAR-Indian Agricultural Statistics Research Institute, New Delhi
3. **Objective(s)** :
   - To familiarize the participants with the basic statistical techniques for analysis of data and making valid inferences from agricultural research
   - To acquaint the participants with the use of statistical software packages for data analysis
   - To help in upgrading the analytical skills of the participants under NARES
4. **Duration** : 10 days
5. **Category of employees** : Technical
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Descriptive statistics
	II	Graphical representation of data
	III	MS-EXCEL : An overview
	IV	MS-EXCEL : Graphical procedures
2	I	SPSS: An overview
	II	Descriptive statistics using SPSS and MS-EXCEL
	III	SPSS: Tables and reports
	IV	SPSS: Graphics
3	I	SAS: An overview
	II	*Practical:* Hands on SAS
	III	Correlation and regression analysis
	IV	*Practical:* Hands on correlation and regression analysis
4	I	Testing of hypothesis
	II	*Practical:* hands on testing of hypothesis
	Exposure Visit	Visit to ASHOKA: Supercomputing hub
	IV	Analysis of variance and covariance
	V	Data diagnostics and transformation

Day	Session	Topic/Activity
5	I	Nonparametric tests
	II	*Practical:* Hands-on nonparametric tests
	III	Planning and designing of experiments
	IV	Basic Experimental designs
6	I	Multiple Comparison procedures
	II	*Practical:* Hands-on basic experimental designs
	III	Groups of experiments
	IV	*Practical:* Hands-on groups of experiments
7	I	Factorial experiments
	II	*Practical:* Hands-on factorial experiments
	III	Split and strip plot design
	IV	*Practical:* Hands-on split and strip plot design
8	I	Analysis of survey data through SPSS
	II	Principal component analysis
	III	Cluster and discriminant analysis
	IV	*Practical:* Hands-on principal Component, cluster and discriminant Analysis
	Exposure Visit	Visit to National Agricultural Science Museum
9	I	Response surface designs
	II	Statistical Modelling
	III	Online Resources of IASRI
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercise, discussions on actual problems faced, interaction and Exposure/Facility visits.

8. Programme Designed, Developed and Organized By:

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Programme: 38

1. **Title** : **Experimental Designs and Statistical Data Analysis**
2. **Organizing Institute** : ICAR-Indian Agricultural Statistics Research Institute, New Delhi
3. **Objective(s)** :
   - To familiarize the participants with the experimental designs and statistical techniques for analysis of data for making valid inferences from their agricultural research
   - To acquaint the participants with the use of statistical software packages for data analysis
   - To help in upgrading the analytical skills of the participants under NARES
4. **Duration** : 02 weeks
5. **Category of employees** : Technical
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
01	Registration	Registration
	Inaugural	Inaugural Programme
	I	Descriptive statistics and exploratory data analysis
	II	MS-EXCEL: An overview
	III	MS-EXCEL: Data analysis
02	I	Testing of hypothesis and analysis of variance
	II	SAS: An overview
	III	*Practical:* Hands-on SAS
	IV	*Practical:* Hands-on testing of hypothesis
03	I	Correlation and regression analysis
	II	*Practical:* Hands-on correlation and regression analysis
	III	Planning of experiments and basic experimental designs
	IV	Multiple comparison procedures
04	I	Data diagnostics and transformation
	II	Incomplete block designs
	III	*Practical:* Hands-on Basic experimental designs and incomplete block designs
	IV	Design resources server and Indian NARS Statistical Computing portal

Day	Session	Topic/ Activity
05	I	Factorial experiments
	II	*Practical:* Hands-on factorial experiments
	III	Analysis of covariance
	IV	Split and strip plot design
06	I	Groups of experiments
	II	*Practical:* Hands-on split/strip plot design and groups of experiments
	III	Response surface designs
	IV	Stability analysis and AMMI
07	I	SPSS for experimental data analysis
	II	*Practical:* Hands-on SPSS for experimental data analysis
	III	Overview of R
	IV	*Practical:* Hands on R for experimental data analysis
08	I	Augmented designs
	II	Crossover designs
	III	Designs for mixture experiments
	IV	ASHOKA: Supercomputing hub
	V	Logit and probit analysis
09	I	Nonparametric tests
	II	*Practical:* Hands-on nonparametric tests
	III	Statistical modelling
	IV	Multivariate analysis of variance
10	I	Principal component analysis
	II	Cluster and discriminant analysis
	III	*Practical:* Hands-on principal component, cluster and discriminant analysis
	IV	Canonical correlation
	Exposure visit	Visit to National Agricultural Science Museum
11	I	Analysis of Repeated Measures Data
	II	Online resources on design of experiments
	III	KRISHI: ICAR Research Data Repository
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercise, discussions on actual problems faced, interaction and Exposure/Facility visits.

8. Programme Designed, Developed and Organized By:

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Programme: 39

1. **Title** : **Introduction to Bioinformatics**
2. **Organizing Institute** : ICAR-Indian Agricultural Statistics Research Institute, New Delhi
3. **Objective(s)** :
   - To familiarize the participants with the various concepts and tools in bioinformatics
   - To help in upgrading the analytical skills of the participants under NARES
4. **Duration** : 02 weeks
5. **Category of employees** : Technical
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Bioinformatics in agriculture
	II	Introduction to bioinformatics
	III	Issues and challenges in bioinformatics
2	I	Introduction to databases
	II	*Practical:* Introduction to databases
	III	Introduction to SSR mining
	IV	*Practical:* SSR Mining
3	I	Overview of NGS technologies
	II	System administrator's perspective of ASHOKA
	III	Gene regulatory network (GRN)
	IV	*Practical:* Gene regulatory network (GRN)
4	I	Machine learning techniques in bioinformatics
	II	Practical on machine learning techniques
	III	Introduction to R
	IV	*Practical:* Introduction to R
5	Exposure visit	ASHOKA
	II	Biocomputing portal
	III	SNP mining and its importance in molecular breeding
	IV	*Practical:* SNP mining

Day	Session	Topic/Activity
6	I	Phylogenetic analysis
	II	*Practical:* Phylogenetic analysis
	III	Metagenomics: An introduction
	IV	Sequence alignment
7	I	Epigenetics
	II	*Practical:* Epigenetics
	III	Statistical perspectives in bioinformatics
	IV	Computational perspectives in bioinformatics
8	I	Protein structure prediction
	II	*Practical:* Protein structure prediction
	III	Protein structure comparison
	IV	Protein structure comparison
9	I	Gene expression analysis
	II	*Practical:* Gene expression analysis
	III	Genomic selection
	IV	*Practical:* Genomic selection
10	I	Programming in bioinformatics
	II	*Practical:* Programming in bioinformatics
	Valedictory	Valedictory Programme

7. **Pedagogy** : Training programme consisted of lectures, practical exercise, discussions on actual problems faced, interaction and Exposure/Facility visits.

8. **Programme Designed, Developed and Organized By**:

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Programme: 40

1. **Title** : **Web Designing, Development and Maintenance of Online Applications**
2. **Organizing Institute** : ICAR-Indian Agricultural Statistics Research Institute, New Delhi
3. **Objective(s)** :
   - To familiarize participants with creating, revising, editing, or otherwise changing existing web pages using open source software
   - To acquaint with advances in web designing and development
4. **Duration** : 10 days
5. **Category of employees** : Technical/Scientist
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Guidelines for designing government websites
	II	Web application architecture
	III	Content tesigning using HTML text formatting
2	I	Content designing using HTML(Tables and Frames)
	II	*Practical Session*
	III	Cascading style sheets (CSS)
	IV	Practical session
3	I	Web server concepts
	II	Practical session
	III	Database concepts
	IV	Practical session
4	I	SQL concepts
	II	Practical session
	III	Drupal
	IV	Practical session
5	I	Server side programming
	II	Practical session
	III	.NET/PHP & MYSQL/MSSQL Server Connectivity
	IV	Practical session

Day	Session	Topic/Activity
6	I	NET/PHP & MYSQL/MSSQL Server Connectivity
	II	Practical session
	III	Open GIS tools
	IV	Java script
7	I	Administration and website hosting
	II	Project work
	III	Feedback
	Valedictory	Valedictory Programme

7. **Pedagogy** : Training programme consisted of lectures, practical exercise, discussions on actual problems faced, interaction, and project work.

8. **Programme Designed, Developed and Organized By**:

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Programme: 41

1. **Title** : **Cyber Security**
2. **Organizing Institute** : ICAR-Indian Agricultural Statistics Research Institute, New Delhi
3. **Objective(s)** :
   - To educate the participants about the threats and security in enterprise networks
   - To impart knowledge and skills on cyber security
4. **Duration** : 10 days
5. **Category of employees** : Technical
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Introduction to Information security & cyber security
	II	Cyber law
	III	Basic networking
2	I-II	Network terminologies – II
	III-IV	Introduction STQC certification security audit
3	I	Desktop security
	II	Desktop security
	III	Email security
	IV	Email security
4	I	Network security
	II	Network security
	III	Digital certificate (SSL, DSC)
	IV	Digital certificate (SSL, DSC)
5	I-IV	Web application security
6	I	Information security management system (ISMS)
	II-III	Information security management system (ISMS
7	I-IV	IT Security controls, plans, and procedures
8	I	Cryptography & steganography
	II	Cryptography & steganography
	Exposure Visit	ICAR-DC visit

Day	Session	Topic/Activity
9	I	Ethical aspects of security
	II	ISO standard
	III	Feedback session
	Valedictory	Valedictory Programme

7. **Pedagogy** : Training programme consisted of lectures, exercise, discussions on actual problems faced, and interaction.

8. **Programme Designed, Developed and Organized By:**

Director of the Institute : Dr. U. C. Sud, Director
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Course Director : Dr. Mukesh Kumar, Principal Scientist
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Course Coordinator : Dr. Sudeep Marwaha, Principal Scientist
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Programme: 42

1. **Title** : **ICAR-ERP System**
2. **Organizing Institute** : ICAR-Indian Agricultural Statistics Research Institute, New Delhi
3. **Objective(s)** :
   - To familiarize the participants with the comprehensive Enterprise Resource Planning (ERP) software for storing and managing the data generated from every process in the organization
   - To resolve the problems faced by the participants while using ERP system
4. **Duration** : 01 week
5. **Category of employees** : Technical
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Introduction to ICAR-ERP
	II	HRMS
	III	*Practical*: HRMS
2	I	HRMS
	II	HRMS
	III	Finance module bill creation
	IV	Finance module bill creation
3	I	Account receivable
	II	General ledger
	III	Payroll
	IV	Payroll
4	I	Project creation/budget upload
	II	RPP-I,II and III
	III	Indent creation
	IV	Purchase order creation

Day	Session	Topic/Activity
5	I	Store management
	II	Java setting
	III	Fixed assets
	IV	Fixed assets
6	I	Unified communication E-mail
	II	Feedback
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercise, discussions on actual problems faced, and interaction.

8. Programme Designed, Developed and Organized By:

Director of the Institute : Dr. A. K. Choubey, Director (Acting)
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HRD Nodal Officer : Dr. Seema Jaggi, Principal Scientist & Head
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Course Director : Dr. Anshu Bharadwaj, Senior Scientist
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Course Coordinator : Dr. Mukesh Kumar, Principal Scientist
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Programme: 43

1. **Title** : **E-Governance Applications in ICAR**
2. **Organizing Institute** : ICAR-Indian Agricultural Statistical Research Institute, New Delhi
3. **Objective(s)** :
   - To impart knowledge about E-Governance concepts and their benefits
   - To sensitize and train the participants on ICAR-ERP
   - To sensitize and train the participants on E-Office
   - To enhance knowledge in different modules of ICAR-ERP
4. **Venue** : Division of Computer Application, IASRI, New Delhi
5. **Duration** : 5 days
6. **Category of employees** : Technical & Administrative staff
7. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Introduction to e-governance
	II	Software packages
	III	Agricultural mobile apps
2	I	Introduction to ERP
	II	ERP HRMS
	III	ERP Finance
	IV	ERP Payroll
	V	ERP Purchases
3	I-II	Introduction to TMIS
	III	*Practical:* TMIS
	IV-V	Introduction to E-Office
4	I	E-Office File Management (Creation, Searching, Registration, Movement)
	II	E-Office (Digital signature)
	III	E-Office (Dispatch, query, report)
	IV	*Practical:* E-Office
	V	*Practical:* E-Office

Day	Session	Topic/ Activity
5	I	ICAR E-mail systems
	II	Webhosting
	III	Feedback and discussion
	Valedictory	Valedictory Programme

8. Pedagogy : Training programme consisted of lectures, practical exercise, discussions on actual problems faced, and interaction.

9. Programme Designed, Developed and Organized By:

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Dr. S. Marwaha, Principal Scientist & Head (Acting)
Computer Applications
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Programme: 44

1. **Title** : **Training Programme on Koha for Library Staff**
2. **Organizing Institute** : ICAR-National Academy of Agricultural Research Management, Hyderabad
3. **Objective(s)** :
   - To make participants understand the application of Koha in library automation
   - To provide the knowledge of broad aspects of Koha installation and customization as per institute requirements
   - To provide hands on training on various modules of Koha
4. **Duration** : 5 days
5. **Category of employees** : Technical staff associated with Library
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/Activity
1	Registration	Registration
	I	Interaction with Programme Directors and socialization
	II	An orientation to Koha, Library management system
	III	Knowledge management
	IV	Introduction to Linux
2	I	Installing ubuntu operating system
	II	*Practical:* Hands-on training on ubuntu installation
	III	Installation and Configuration of Koha, configuration of apache and MySQL and hands on training
	IV	Introduction to different modules of Koha
	V	Koha features and technology
3	I	Koha administration
	II	Acquisition
	III	Patrons
	IV	*Practical:* Koha Administration - Hands-on training
	V	*Practical:* Acquisition - Hands-on training
	VI	*Practical:* Patrons - Hands-on training

Day	Session	Topic/Activity
4	I	Koha Cataloguing
	II	Circulation
	III	Serials, OPAC
	IV	Development of Digital Libraries using DSpace
	V	*Practical:* Koha cataloguing, Circulation - Hands-on training
	VI	*Practical:* Serials, OPAC-Hands-on training
5	I	Koha tools and reports
	II	Course feedback
	Exposure Visit	Visit to NAARM Library
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercise, discussions on actual problems faced, interaction and Exposure visit.

8. Programme Designed, Developed and Organized By:

Director of the Institute : Dr. Ch. Srinivasa Rao, Director
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HRD Nodal Officer : Dr. R.V. S. Rao, Principal Scientist and In-charge Head HRM Division
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Course Director(s) : Dr. S. K. Soam, Joint Director (Acting)
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Dr. N. Srinivasa Rao, Principal Scientist
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Programme: 45

1. **Title** : **Automobile Maintenance, Road Safety and Behavioural Skills for Regular Drivers**
2. **Organizing Institute** : ICAR-Central Institute of Agricultural Engineering, Bhopal
3. **Objective(s)** :
   - To induce the basic skills on automobiles (LMV / HMV), monitoring and maintenance.
   - To ensure road safety and exposure to motor vehicle rules (with amendments)
   - To improve behavioural and communication skills for all-round personality development
4. **Duration** : 01 week
5. **Category of employees** : Regular Drivers in Technical Grades
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Introduction to vehicle management system and selection of spares/tyres, etc.
	II	Road safety and traffic management
	Field visit	Visit to Institute facilities
2	I	Insurance claim procedures and guidelines applicable to vehicle and drivers
	II	Periodic and preventive maintenance of vehicle and its advantages/ economics
	III	*Practical*: Break down diagnostic and management during outside running of vehicle
3	I	Development of behavioural and communicational skills
	II	Guidelines of road safety, general traffic rules and Motor Vehicle (Amendment) Bill 2017
	III	*Practical*: Hands-on-training and exposure to advanced features /technologies of modern motor vehicles
4	I	Exposure to different systems of motor vehicles with the aim for effective maintenance
	II	Experience sharing by Drivers
	III	*Practical*: Hands-on-training and exposure to advanced features / technologies of modern motor vehicles

Day	Session	Topic/Activity
	Exposure visit	Visit to EICER Tractor Plant, Mandideep / CFMTTI, Budni
5	Exposure visit	Industrial/Educational and local visits
6	I	Tips for driving for saving of fuel and better mileage
	II	Basics of effective First-Aid management
	III	Exposure to use of battery in motor vehicles with the aim of proper use and effective maintenance
	IV	*Practical:* Servicing of vehicle, assessment of wearing of parts, general electric check-up of vehicle and functional check of main electric components and systems.
	V	*Practical*: Hands-on-training and exposure to advanced features and technologies of modern motor vehicles
7	I	Personal Information Managements in ICAR-ERP System
	II	Route management through GPRS/Cell and indent, log book maintenance work
	III	Interaction with participants & their feedback
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercise, demonstrations, discussions, interactions, experience sharing, and Workshop/Exposure visits.

8. Programme Designed, Developed and Organized By:

Director of the Institute : Dr. K. K. Singh, Director
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Course Director : Er. D. K. Dwivedi. Chief Technical Officer
Email: dwivediciae@gmail.com

Programme: 46

1. **Title** : **Repair and Maintenance of Office and Residential Building including Guest Houses**
2. **Organizing Institute** : ICAR-Central Institute of Agricultural Engineering, Bhopal (in coordination with Works/Engineering Cell and HRM Unit of ICAR)
3. **Objective(s)** :
   - To make the participants acquainted with preparation of work proposals, estimates, planning & design of building including safety measures
   - To aware the participants about Annual repair maintenance of operations (ARMO)-civil and electrical
4. **Duration** : 03 days
5. **Category of employees** : Technical and Administrative staff associated with Works and Building Maintenance
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	Site visit	Visit to working site of the Institute
	II	Administrative procedures for works proposals
	III	Introduction and process for work proposals, preparation of estimate, selection of agency, monitoring of ongoing works
	IV	Planning of works & ARMO specifications and ARMO-Civil
2	I	Green building concept and design, development, commissioning and maintenance of roof top solar system (RTS)
	II	Master plan & maintenance of land records of the Institute
	III	Experience sharing by participants
	Site Visit	Visit to see working (construction) sites, green building, etc.
3	I	Allocation of EFC, process for obtaining AA & ES of the C/A, adjustment of expenditure account, etc.
	II	Annual repair maintenance of operations (ARMO) - Electrical and Substation etc.
	III	Planning & design of building including safety measures
	IV	Interaction with participants & their feedback.
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, exercise, demonstrations, discussions on actual problems faced, interactions, experience sharing and site visits.

8. Programme Designed, Developed and Organized By :

Director of the Institute : Dr. C. R. Mehta, Director
Email: crmehta65@yahoo.co.in; directorciae@gmail.com

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Course Director : Sh. Kumar Rajesh, Chief Administrative Officer
Email: kumarrajeshicar@gmail.com

Course Coordinator : Sh. D. K. Jain, Chief Technical Officer
Email: dilipkumarjain99@gmail.com

Programme: 47

1. **Title** : **Motivation, Positive Thinking and Communication Skills for Technical Staff (T1 to T4) of ICAR**
2. **Organizing Institute** : ICAR-National Academy of Agricultural Research Management, Hyderabad
3. **Objective(s)** :
   - To improve skills and efficiency in discharging functions and providing constructive technical support in meeting the organizational goals and targets.
4. **Venue** : ICAR-National Institute of Animal Nutrition and Physiology, Bengaluru
5. **Duration** : 12 days
6. **Category of employees** : Technical (T1 to T4)
7. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Introduction about the host institute Programme overview and interaction with participants
	II	Positive thinking and team work
	III	Safety management practices in Laboratories
	IV	Yoga and pranayama theory
2	I	Time management
	Lab/Exposure visit	Visit to the laboratories & facilities in the host institute
	III & IV	Role & responsibilities of technical staff in Agricultural Research System
3	I	Integrated Farming Systems - a viable option for doubling the farmer's income
	II	In pursuit of excellence
	III & IV	*Theory & Practical*: Effective presentation techniques
4	Exposure visit	Educational /exposure visits to places of worth seeing
5	I &II	Motivational techniques with practical exercises
	III &IV	Effective communication – A process towards motivation
5	I & II	Effective inter-team communication with practical exercises
	III &IV	Personality profiling & personality development with practical exercises

Day	Session	Topic/Activity
6	I & II	Positive attitude for personality development
	III & IV	Interpersonal relationship with practical exercises
7	Exposure Visit	Visit to local places
8	I	Stress management
	II	Lifestyle management
	III & IV	Emotional intelligence with practical
9	I & II	Team building / management with practical exercise
	III & IV	FMS/MIS/ Technical services rules
10	I & II	Assertiveness at workplace
	III & IV	Trust building with practical
11	I	Role understanding with exercises
	II	Computer based feedback from Participants
	Valedictory	Valedictory Programme

8. Pedagogy : Training programme consisted of lectures, practical exercise, discussions, interaction, case studies and Exposure visit.

9. Programme Designed, Developed and Organized By:

Director of the Institute : Dr. Ch. Srinivasa Rao, Director
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HRD Nodal Officer : Dr. R.V. S. Rao, Principal Scientist, In-charge Head HRM Division
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Course Director : Sh. M. A. Basith, Chief Technical Officer
Email: mabasith@naarm.org.in

Co-Course Director : Sh. G. Aneeja, Asstt. Chief Technical Officer
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Programme: 48

1. **Title** : **Motivation, Positive Thinking and Communication Skills for Technical Staff (T5 and above) of ICAR**
2. **Organizing Institute** : ICAR-National Academy of Agricultural Research Management, Hyderabad
3. **Objective(s)** :
   - To improve skills and efficiency in discharging functions and providing constructive technical support in meeting the organizational goals and targets.
4. **Duration** : 5 days
5. **Category of employees** : Technical (T5 and above)
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Programme overview and interaction with participants
	II	Role of Technical Officers in ICAR
	III	Team work
2	I	Motivation
	II	Positive thinking
	III	Communication skills
3	I	Personality profiling & personality development
	II	Interpersonal relationship
	III	Communication through social media
4	I	Office communication
	II	ICAR Initiatives for training of technical personnel
	III	On-line communication
5	I	Positive attitude to work in Teams
	II	Data visualization for better communication
	III	Feedback from participants
	Valedictory	Valedictory Programme

7. **Pedagogy** : Training programme consisted of lectures, practical exercise, discussions, interaction and case studies.

8. Programme Designed, Developed and Organized By:

Director of the Institute	:	Dr. Ch. Srinivasa Rao, Director Email: director@naarm.org.in
HRD Nodal Officer	:	Dr. R.V. S. Rao, Principal Scientist, In-charge Head HRM Division Email: rvs@naarm.org.in
Course Director	:	Dr. B. S. Yashavanth, Scientist Email: yashavanth@naarm.org.in
Co-Course Director	:	Dr. Laxman M. Ahire, Asstt. Chief Technical Officer Email: ahire@naarm.org.in

Programme: 49

1. **Title** : **Enhancing Personal Effectiveness at Workplace**
2. **Organizing Institute** : ICAR-Indian Agricultural Research Institute, New Delhi
3. **Objective(s)** :
   - To create understanding among the technical staff about the workplace behaviours and effectiveness
   - To sensitize participants about the soft skills essential to manage better at workplace
4. **Venue** : Division of Agricultural Extension, IARI, New Delhi
5. **Duration** : 01 week
6. **Category of employees** : Technical
7. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Micro-lab
	II-III	Understanding personal effectiveness
2	I	Goal setting (Ring Toss exercise)
	II	Understanding strengths and weaknesses (Tower building exercise)
	III	Self-motivation
	IV	Motivation at workplace
3	I	Job roles & Job satisfaction at workplace
	II	Stress and conflict management
	III	Time management
	IV	Creativity
4	I	Team building (Acid river crossing exercise / Broken Square Exercise)
	II	Effective communication skills
	III	Basic ICT skills at workplace
	IV	Etiquettes
5	I	Gender sensitization at work place
	II	Sharing of work experiences and action plan for implementation
	III	Feedback from participants
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercise, discussions, interaction, case studies and experience sharing.

8. Programme Designed, Developed and Organized By:

Director of the Institute : Dr. A. K. Singh, Director (Acting) & DDG (Ag. Extn)
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HRD Nodal Officer : Dr. Girish Kumar Jha, Principal Scientist
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Course Director : Dr. Premlata Singh, Head
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Course Coordinator(s) : Dr. V. Sangeetha, Scientist
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Dr. G.S. Mahra, Scientist
Email: girijeshmahra22@gmail.com

4.3

ADMINISTRATIVE STAFF INCLUDING FINANCE

Administrative and Finance Staff

Programme: 1

1. **Title** : **Trainers' Development Programme for Various Cadres of Administrative and Finance Staff**
2. **Organizing Institute** : ICAR-National Academy of Agricultural Research Management, Hyderabad
3. **Objective(s)** :
   - To equip participants with conceptual understanding of training and learning processes
   - To provide training design and delivery skills
   - To facilitate networking among the participants for designing and conducting training programmes
4. **Duration** : 01 week
5. **Category of employees** : Administration and Finance
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
		Overview of Training, Training Process and Learning Concepts
	I	Introduction of Participants, Training Expectations and Ground Rules for Learning
	II	**Overview of Training and Training Policy vis-à-vis ICAR Training Policy**
	III	Learning Concepts Effectiveness: Training & Development
2		**Systematic Approach to Training, Training Needs Assessment, and Training Methods**
	I	Learning log
	II	Performance gap-Objective assessment & SAT (Systematic Approach to Training) EXERCISE
	III	Identifying training needs, Writing training Objectives and Deciding Training Contents
	IV	Design of training (Developing Course Outline) and training methods
3		**Design of Training, Training Skills and Management of Trainees**
	I	Learning log and using group discussion as a method of learning
	II	Innovative training methods
	III	Training delivery skills
	IV	Understanding and Managing Trainees, and Creating effective presentations

Day	Session	Topic/ Activity
4		**Monitoring & Evaluation of Training and Trainer Roles**
	I	Learning log and evaluation of training: Overview and models
	II	Impact assessment of training programme and Use of Technology in Training Management
	III	Roles of Trainer
	IV	Preparation of Action Plan on training Design by participants
5	Exposure visit	Educational visit for exercise on Training Needs Assessment
6		**Action Plan Presentation**
	I	Learning log
	II	Presentation of Action Plan on Training Design by participants
	III	Online Feedback
	Valedictory	Feedback & Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, exercise, discussions on actual problems faced, interaction, preparation and presentation of Action Plan and Exposure visit.

8. Programme Designed, Developed and Organized By:

Director of the Institute : Dr. Ch. Srinivasa Rao, Director
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HRD Nodal Officer : Dr. R.V. S. Rao, Principal Scientist, In-charge Head HRM Division
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Course Director(s) : Dr. S. K. Soam, Joint Director (Acting)
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Dr. Bharat Sontakki, Head, ExSM Division
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Programme: 2

1. **Title** : **MDP on Administrative and Financial Management for Group-A Officers of ICAR**
2. **Organizing Institute** : ICAR-National Academy of Agricultural Research Management, Hyderabad
3. **Objective(s)** :
   - To help participants understand their own personality dimensions
   - To adapt ideas of diverse skills for sharpening capacities to effectively execute various roles in the organization.
   - To provide an opportunity for senior officers of ICAR for mutual interaction and knowledge sharing among them.
   - To explore the leadership challenges and core competencies needed in the present day context
4. **Venue** : ICAR-National Dairy Research Institute, Karnal
5. **Duration** : 05 days
6. **Category of employees** : Administrative including Finance (Deputy Secretaries, Chief Administrative Officers, Chief Finance & Accounts Officers, Senior Administrative Officers, Under Secretaries & Senior Finance & Accounts Officers)
7. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Sharing experience & working tips (Scientists-Admn-Finance interface)
	II-III	GFR 2017, Purchase procedure and case studies
2	I-II	Budget planning, implementation and monitoring (FEC)
	III-IV	Recruitment, peservation roster-DPC and promotion with case studies
3	I-II	Conflict resolution
	III-IV	Seminar on emotional intelligence and organizational effectiveness
4	Exposure visit	Educational Visit
5	I	Labour laws & handling of labour problems in ICAR Institutes
	II	Vigilance management
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, exercise, discussions on actual problems faced, interaction, experience sharing, case studies and Exposure visit.

8. Programme Designed, Developed and Organized By:

Director of the Institute : Dr. Ch. Srinivasa Rao, Director
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HRD Nodal Officer : Dr. R.V. S. Rao, Principal Scientist, In-charge Head HRM Division
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Course Director(s) : Sh. B. D. Phansal, JD(A) & Registrar
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Sh. Z. H. Khilji, CFAO
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Programme: 3

1. **Title** : **Establishment and Financial Matters for Group-B Officers of ICAR**
2. **Organizing Institute** : ICAR-National Academy of Agricultural Research Management, Hyderabad
3. **Objective(s)** :
   - To enhance administrative and financial skills to discharge day to day duties more efficiently and effectively.
   - To provide an opportunity for mutual interaction and knowledge sharing among themselves
4. **Duration** : 01 week
5. **Category of employees** : Administrative including Finance (Assistants/ AAO / AOs / JAO/AF&AO/F&AO/Section Officers)
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Establishment rules
	II	Reservations in services for SC/ST/OBC
	III	Technical service rules
2	I	Pension & other retirement benefits
	II	Pay fixation
	III	E-procurement/purchase management in Government
	IV	Ethics and values in public governance
3	I	Good governance through HR practices
	II	Communication skills
	III	Team building
	IV	Financial systems
4	Exposure Visit	Educational visit
5	I	Management and accountability in Government
	II	GEM
	III-IV	E-learning and digital education

Day	Session	Topic/Activity
6	I	RTI
	II	Feedback
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, exercise, discussions on actual problems faced, interaction, case studies and Exposure visit.

8. Programme Designed, Developed and Organized By:

Director of the Institute : Dr. Ch. Srinivasa Rao, Director
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HRD Nodal Officer : Dr. R.V. S. Rao, Principal Scientist, In-charge Head HRM Division
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Course Director(s) : Shri J. N. L. Das, SAO
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Shri. W. Srinivas Bhatt, Administrative Officer
Email: ao@naarm.org.in

Programme: 4

1. **Title** : **Establishment Matters for LDC and UDC of ICAR**
2. **Organizing Institute** : ICAR-Central Institute of Fisheries Education, Mumbai (in coordination with Administration Section and HRM Unit of ICAR HQs)
3. **Objective(s)** :
   - To update the knowledge and enhance the administrative and financial skills of participants to discharge day to day duties more efficiently and effectively
   - To provide an opportunity for mutual interaction and knowledge sharing among themselves for meeting the organizational goals and targets
4. **Duration** : 01 week
5. **Category of employees** : Administrative including Finance
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I-II	Record and financial management
	III	RTI & Leave rules
	IV	Asset management
2	I-II	Office Procedure & interaction
	III	*Theory & Practical:* MS Word
	IV	*Theory & Practical:* MS Excel
3	I	Noting
	II	*Practical:* Noting
	III	Drafting
	IV	*Practical:* Drafting
4	Educational visit	Visit of Educational Institutes and Historical Places of importance
5	I-II	Motivational & positive thinking
	II-IV	Office procedure (CSMOP)
6	I	E-office
	II	*Practical:* E-Office
	III	LTC & Advances
	IV	Service book

Day	Session	Topic/Activity
	I-II	*Practical:* FMS/ PFMS
	III	GFR
	Valedictory	Feedback and Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercise, discussions on actual problems faced, interaction, and Exposure visit.

8. Programme Designed, Developed and Organized By:

Director of the Institute : Dr. Gopal Krishna, Director
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Course Co-Director(s) : Ms. Anjali Sharma, Section Officer
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Ms. Poonam Behl, AAO
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Programme: 5

1. **Title** : **Assets Management**
2. **Organizing Institute** : ICAR-Indian Agricultural Research Institute, New Delhi (in coordination with Finance Division and HRM Unit of ICAR HQs)
3. **Objective(s)** :
   - To bring out importance of Assets management and related record keeping for effective functioning
4. **Duration** : 03 days
5. **Category of employees** : Administrative including Finance
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Classification of Assets, GFR provisions on assets register, etc.
	II	Works, buildings and facilities
	III	Equipment and structures
2	I	Intellectual property rights, patents, copy right, etc.
	II	IT Assets, hardware, software and latest development in record keeping, RFID, block chains, etc.
	III	Land, vehicles, furnitures and fixtures, books, journals, etc.
	Exposure visit	Visit to division(s) of IARI & practical
3	Field visit	Field and farm equipments - field visit
	II	Presentation by participants & discussion
	Valedictory	Feedback & Valedictory Programme

7. **Pedagogy** : Training programme consisted of lectures, exercise, discussions on actual problems faced, interaction, participants' presentation and Field/Exposure visit.
8. **Programme Designed, Developed and Organized By**:

   Director of the Institute : Dr. A. K. Singh, Director (Acting) & DDG (Ag. Extn)
   Email: director@iari.res.in

HRD Nodal Officer	:	Dr. Girish Kumar Jha, Principal Scientist Email: girish.stat@gmail.com
Course Director	:	Sh. V. R. Srinivasan, Comptroller Email: comptroller@iari.res.in
Course Coordinator(s)	:	Sh. A. K. Maithani, SAO, (P-II) Sh. P. K. Gupta, F&AO, A-III

Programme: 6

1. **Title** : **Workshop for Effective Handling of Court Cases**
2. **Organizing Institute** : ICAR-Central Arid Zone Research Institute, Jodhpur (in coordination with Legal Cell and HRM Unit of ICAR HQs)
3. **Objective(s)** :

At the end of the workshop the participants shall be able to:

- describe the concept of Courts and Court cases in terms of the Indian legal System and the governance mechanism in ICAR
- demonstrate necessary skills in arranging defence in matters at the CAT(s) and follow up steps after passing the order
- describe different kinds of writs and demonstrate necessary skills in arranging defence in matters at the CAT(s) and follow up steps after passing the order
- describe various steps in handling the Writ Petitions in HCs/ SC and and demonstrate necessary skills in preparation of para-wise comments and Affidavits, etc.
- define the mechanism of engagement/ empanelment of Advocates in ICAR/ its Institutes and payment of fees, etc.

4. **Duration** : 03 days
5. **Category of employees** : Administrative Staff dealing with Court Cases/Law Officers
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topics/Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Overview of ICAR & CAZRI
	II	Introduction to the concept of courts and cases as per the Indian legal system with specific reference to ICAR system
	III	A case study & exercise on arranging defence in a case in CAT; Filing of O.A. arranging defense of cases, Preparation of comments/reply/WS/Rejoinder, etc.
	IV	Steps after passing of the order/interim order; Handling of miscellaneous applications

Day	Session	Topics/Activity
2	I	Constitutional provisions of writ petition/W.P.; Handling of W.P in the High Court
	II	Preparation of comments/ reply/rejoinder; Handling of miscellaneous applications; Steps after passing of the order /interim order
	III	Exercise & Case study on handling a writ petition in High Court
	Field visit	Field exposure visit
3	I	Case study on Civil Appeal & handling of SLP /Civil appeal in Hon'ble Supreme Court. Contempt cases, arbitration matters, civil suit/succession cases
	II	Information about ICAR rules & Bye Laws & follow up action of the disposed of cases
	III	Guidelines issued by the ICAR on handling of the court cases; Handling & processing of bills of advocates & panel advocates
	IV	Motivation, Interpersonal relations and stress management in work place
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, exercise, case studies, discussions on actual problems faced, interaction, and Exposure visit.

8. Programme Designed, Developed and Organized By:

Director of the Institute : Dr. O. P. Yadav, Director
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Sh. K. L. Meena, Chief Administrative Officer
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Programme: 7

1. **Title** : **Making a Secure and Resilient Workplace**
2. **Organizing Institute** : ICAR-Central Potato Research Institute, Shimla (in coordination with HRM Unit of ICAR HQs)
3. **Objective(s)** :

   At the end of the course the participants shall be able to:

   - define the general aspects of Security and role and responsibilities of Security Officers
   - demonstrate capabilities of handling fire safety & other natural hazards
   - define various aspects of information security, cyber security and related Laws & recent advances in the ICT related security aspects
   - demonstrate team related behavioural dynamics towards creating a secured and resilient workplace

4. **Duration** : 03 days
5. **Category of employees** : Administrative/Technical Staff dealing with Security / Security Officers
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topics/Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	General aspects of security and role and responsibilities of Security Officers
	II	Fire safety (Theoretical)
	III	Fire safety (Field Demonstration)
2	I	Disaster management
	II	Information security & cyber law
	Exposure visit	Educational tour to CPRS Kufri
3	I	Security contracts, agencies & laws
	II	Behavioural aspects of security
	III-IV	Importance of communication channel & Mock Drill
	Valedictory	Feedback & Valedictory Programme

7. **Pedagogy** : Training programme consisted of lectures, field demonstration, mock drills, exercises, discussions on actual problems faced, interaction, and Exposure visit.

8. Programme Designed, Developed and Organized By:

Director of the Institute	:	Dr. S. K. Chakraborti, Director Email: director.cpri@icar.gov.in
HRD Nodal Officer	:	Dr. N. K. Pandey, Principal Scientist Email: nkpcpri@gmail.com
Course Director	:	Sh. Sandeep Singh Dudi, Admin. Officer Email: sandeep.dudi@gmail.com
Course Coordinator	:	Smt. Poonam Sood, AAO Email: e1.cpri@icar.gov.in

Programme: 8

1. **Title** : **ICAR-ERP Finance Module**
2. **Organizing Institute** : ICAR-Indian Agricultural Statistics Research Institute, New Delhi
3. **Objective(s)** :
   - To familiarize participants with comprehensive usage and operation of Enterprise Resource Planning (ERP) Finance Module
   - To provide an opportunity for mutual interaction and knowledge sharing among participants
4. **Duration** : 01 week
5. **Category of employees** : Finance Officers of ICAR
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Introduction to ICAR-ERP
	II	HRMS
	III	*Practical:* HRMS
2	I	Finance – AP Module: Bill creation (All Types), reports
	II	Finance – AP Module: Bill creation (All Types), reports
	III	Finance – AP Module: vendor creation
	IV	Finance – AP Reports: PAN Update Process
3	I	Finance – AP Module : Bill Validation, bill payment (All Types), reports
	II	Finance – AP Module: Define cheque series (Manual & EFT)
	III-IV	Finance – AP Reports: Practice session
4	I	Finance – GL Module: Budget entry, Journal entry Etc., reports
	II	Finance – GL Module: Practice session
	III	Finance – AR Module: Receipts (All Types), reports
	IV	Finance – AR Module: Practice session
5	I-III	Finance – FA Module: Manual asset addition, reports
	Exposure visit	Visit to Facilities of the Institute
6	I	Finance – FA Module : Asset addition – Procurement process, reports
	II	Finance – FA Module : Asset retirement process, reports
	III-IV	Finance – FA Module : Practice session

Day	Session	Topic/ Activity
7	I	Query session with IBM
	II	Feedback session
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercises, discussions on actual problems faced, interaction, and Exposure visit.

8. Programme Designed, Developed and Organized By:

Director of the Institute : Dr. L. M. Bhar, Director (Acting)
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Course Coordinator(s) : Dr. Sudeep Marwaha, Principal Scientist
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Dr. Shashi Dahiya, Senior Scientist
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Programme: 9

1. **Title** : **Hospitality Management**
2. **Organizing Institute** : ICAR-National Academy of Agricultural Research Management, Hyderabad (in collaboration with Institute of Hospitality Management, Catering Technology & Applied Nutrition, Hyderabad)
3. **Objective(s)** :
   - To improve skills and efficiency in discharging functions of Hospitality Management and providing constructive technical support in meeting the organizational goals and targets
   - To provide an opportunity for mutual interaction and knowledge sharing among participants
4. **Duration** : 01 week
5. **Category of employees** : Administrative/Technical Staff associated with Guest Houses
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Programme Overview; Hospitality management (Latest Trends)
	II	Kitchen management
	III	Hotel Engineering; Pantry operations
2	I	Reception/Front officer management
	II	Personality and grooming
	III	Purchase management
	IV	Stores management
3	I	Facility management & infrastructure development
	II	*Practical:* Table laying
	III	Food & beverage management
	IV	HRM in hospitality industry

Day	Session	Topic/Activity
4	I -II	House Keeping *Practical:* House Keeping (Bed making, Flower arrangements, cleaning materials)
	III	Nutrition
	IV	Waste management
5	I	First aid treatment
	II	Discussion & feedback
	Valedictory	Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercise, demonstration, discussions on actual problems faced, interaction, and Exposure visit.

8. Programme Designed, Developed and Organized By:

Director of the Institute : Dr. Ch. Srinivasa Rao, Director
Email: director@naarm.org.in

HRD Nodal Officer : Dr. R.V. S. Rao, Principal Scientist, In-charge Head HRM Division
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Course Director(s) : Sh. Shyam Bahadur, ACTO
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Ms. Savithri Mural, Sr. Technical Officer
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Programme: 10

1. **Title** : **Enhancing Efficiency and Behavioural Skills of Stenographer Grades**
2. **Organizing Institute** : ICAR-National Academy of Agricultural Research Management, Hyderabad
3. **Objective(s)** :
   - To enhance the work efficiency and effectiveness of Stenographers Grade employees
   - To improve the Behavioural skills of the participants
4. **Duration** : 01 week
5. **Category of employees** : Stenographer Grade-III, PA, PS, PPS
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I-II	Role Perception for efficiency & effectiveness
	III	Official Language
2	I-II	*Theory & Practical:* PFMS and MIS
	III	*Theory & Practical:* TMIS
	IV	Communication skills
3	I	Rules & Bye laws
	II	Conduct rules
	III	Motivation
	IV	GEM
4	Exposure Visit	Educational visit
5	I	Physical and mental health management
	II	Organizational behaviour
	III-IV	Team building
6	I	RTI/Ethic and integrity
	II	Feedback
	Valedictory	Valedictory Programme

7. **Pedagogy** : Training programme consisted of lectures, practical exercise, discussions on actual problems faced, interaction, and Exposure visit.

8. Programme Designed, Developed and Organized By:

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Course Director	:	Shri P. K. Kohad, AAO Email: pgkohad@naarm.org.in
Co-Course Director	:	Shri N. Raghunath, SPO Email: raghu@naarm.org.in

4.4

SKILLED SUPPORT STAFF

As Skilled Support Staff at each Institute normally belong to the same State and well versed in the local/ regional language, therefore, the medium of instruction is the same so that they can easily understand and learn different aspects of knowledge and skills comfortably

Skilled Support Staff

Programme: 1

1. **Title** : **Orientation Training Programme on Rice Production Technology**
2. **Organizing Institute** : ICAR-Indian Institute of Rice Research, Hyderabad
3. **Objective(s):**
   - To acquaint SSS about rice production technology
   - To acquaint the SSS with waste management through preparation of compost and vermicompost
4. **Duration** : 03 days
5. **Category of employees** : Skilled Support Staff
6. **Course content (day-wise theory and practical course content) :**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Role of IIRR in providing improved rice varieties and package of practices to farmers to improve income
	II	Improved rice varieties and their quality characteristics
	III	Cultivation practices of rice for minimizing water, labor and cost of cultivation
	IV	Integrated nutrient management to save cost on fertilizers
2	I	*Practical*: Soil sample collection using rapid soil analysis kit
	II	*Practical*: Identification of insect-pest and disease attack in rice fields
	III	*Practical*: Demonstration on tissue culture, culture of insects and microorganisms
	IV	*Practical*: Waste management through preparation of compost and vermicompost
3	Exposure visit	Visit to neighboring ICAR-Institutes
	Field visit	Visit to IIRR Farm for showcasing experimental plots of breeding, hybrid rice, water saving technologies, pest & diseases management
	Field visit	Visit to glass house and net house to show experiments in pot culture
	Exposure visit	Visit to IIRR museum to showcase rice research progress over the years through models and digital display boards
	Valedictory	Feedback & Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercises, discussions, interaction, and Field/Exposure visit.

8. Programme Designed, Developed and Organized By:

Director of the Institute : Dr. S. R. Voleti
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Course Coordinator : Dr. Arun Kumar, Scientist
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Note: ***Similar type of training modules may be developed and organized by other commodity-based Institutes.***

Programme: 2

1. **Title** : **Skill Up-gradation of Skilled Support Staff of Cotton Institute**
2. **Organizing Institute** : ICAR-Central Institute for Cotton Research, Nagpur
3. **Objective(s)** :
   - To upgrade skills of newly recruited Skilled Support staff
   - To acquaint with basic techniques and practices in cotton cultivation
4. **Duration** : 04 days
5. **Category of employees** : Skilled Support Staff
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Basics of production and ICT in Cotton
	II	Agronomic practices for cotton production
	III	*Practical*: Field layout and soil health management
	IV	*Theory & Practical*: Cotton insect-Pest and diseases management and safe handling of insecticides and pesticides
	Lab visit	Visit to PBW Lab and Bt referral Lab
2	I	*Theory & Practical*: Seed production in cotton
	II	Wild species of cotton
	III	*Theory & Practical*: Cotton varieties and hybrids
	IV	*Theory & Practical*: Fertilizers and optimum use of agro-chemicals
	V	*Practical*: Biometric system and computer application
3	I	Motivation and positive thinking
	II	Administrative rules and procedures
	III	Record keeping
	IV	Financial matters and pension rules
	Valedictory	Feedback & Valedictory Programme
4	Field/Exposure visit	ICAR-CCRI, Nagpur
		ICAR-GTC, Nagpur
		ICAR-NBSS & LUP , Nagpur
		KVK-Wardha

7. Pedagogy : Training programme consisted of lectures, practical exercises, demonstrations, discussions, and interaction, Lab/Field/Exposure visit, etc.

8. Programme Designed, Developed and Organized By:

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Course Director : Dr. J. H. Meshram, Principal Scientist
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Course Coordinator : Dr. Shailesh Gawande
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Programme: 3

1. **Title** : **Principles and Practices of Seed Production, Processing, Storage and Quality Assurance**
2. **Organizing Institute** : ICAR-Indian Institute of Seed Science, Mau
3. **Objective(s)** :
   - To enhance capacity of skilled support staff for quality seed production through hands-on practical training in production, processing, storage & quality assurance
   - To aware with various aspects of seed production, processing, storage & quality assurance
4. **Duration** : 05 days
5. **Category of employees** : Skilled Support Staff
6. **Course content (day-wise theory and practical course content) :**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme & pre-evaluation test
	I	Seed production & supply system in India: A brief overview
	II	Basic principles of quality seed production
	III	Seed production programme through cluster approach
	Field Visit	Field visit and acquaintance with seed production methodologies
2	I	Insights on seed quality parameters & factors determining seed quality
	II	*Theory & Practical:* Do's & don'ts of nucleus and breeder's seed production
	III	*Theory & Practical:* Seed production technology in rice and wheat
	Lab visit	Visit to Seed Technology Lab to understand the principles, importance and different methods of seed testing *Practical*: Seed sampling & purity analysis
3	I	*Theory & Practical:* Seed processing machineries: Functions and troubleshooting
	II	*Theory & Practical:* Safety measures during handling of seed processing machineries
	III	*Theory & Practical:* Methods of seed storage and quality controls measures in seed stores
	Exposure Visit	Visit to commercial seed processing plant & seed godown

Day	Session	Topic/ Activity
4	I	*Theory & Practical:* Seed production planning & implementation of production schedules
	II	*Theory & Practical:* Identification of genetic contaminants in seed crop and corrective measures to ensure genetic purity
	III	Principles of Grow Out Test (GOT) & laying out of GOT plots for genetic purity testing
	IV	*Practical:* Practical aspects of moisture testing, seed germination & evaluation
5	I	*Practical:* Hands-on seed viability & vigour testing
	II	*Practical:* Hands-on seed health testing
	III	Post evaluation of trainees
	Valedictory	Feedback & Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercises, discussions, interaction, and Field/Lab/ Exposure visit.

8. Programme Designed, Developed and Organized By:

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Dr. Kalyani Kumari, Scientist
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Programme: 4

1. **Title** : **Sampling Techniques for Soil, Water and Plant Analysis**
2. **Organizing Institute** : ICAR-Indian Institute of Horticultural Research, Bengaluru
3. **Objective(s)** :

   To train SSS staff in :

   - Collection of soil samples from annual crops and perennial crops and processing for analysis of nutrients
   - Collection of water samples for analysis
   - Collection of plant samples and processing for analysis of nutrients
4. **Duration** : 4 days
5. **Category of employees** : Skilled Support Staff
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Principles and methods of soil sampling
	II	*Practical*: Soil sampling in annual & perennial crops; Quartering technique to reduce bulk soil; Homogenizing & Packing soil sample; Dos and Don'ts in soil sampling
	III	*Practical*: Processing, drying, powdering and sieving of soil sample for analysis; Sample preparation for nutrient analysis
2	I	*Practical*: Estimation of soil pH and EC
	II	Theory & *Practical*: Importance of water analysis, Methods of water sampling, Parameters analyzed in water analysis
	III	Theory & *Practical*: Importance of plant analysis; steps involved in plant sampling; Dos and Don'ts of plant sampling
	IV	*Practical*: Leaf sampling technique in mango, papaya and guava
3	I	*Practical*: Processing, washing and drying leaf sample for analysis
	II	*Practical*: Oven drying, grinding and preserving the plant sample
	III-IV	*Practical*: Good laboratory practices, Soil sample storage facilities and plant storage facilities

Day	Session	Topic/ Activity
4	Lab visit	Visit to various laboratories to learn the instrumental techniques: pH meter, EC bridge, AAS, Flame photometer, Mechanical Shaker, Hot air oven, etc.
	Valedictory	Feedback & Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercises, discussions on actual problems faced, interaction, and Lab visit.

8. Programme Designed, Developed and Organized By:

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HRD Nodal Officer : Dr. T. N. Shivananda, Principal Scientist
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Course Director : Dr. H. G. Raghupathi, Principal Scientist and Head
Division of Natural Resources
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Course Coordinator : Dr. Rupa T. R., Principal Scientist
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Programme: 5

1. **Title** : **Microbiological Tools and Techniques**
2. **Organizing Institute** : ICAR-National Bureau of Agriculturally Important Microorganisms, Mau
3. **Objective(s)** :
   - To develop requisite competency of SSS to ably assist the scientists for management of microbiological work
   - To train the participants in safe handling of various microbiological instruments
4. **Duration** : 05 days
5. **Category of employees** : Skilled Support Staff
6. **Course content (day-wise theory and practical course content) :**

Day	Session	Topics/Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Microbial techniques
	II	*Practical*: Good microbiological practices
	III	*Practical*: Washing and cleaning of glasswares
	IV	*Practical*: Types of balance and its working
	V	*Practical*: Measuring equipments and procedures
2	I	Role of microorganisms in crop productivity and soil health
	II	*Practical*: Collection of soil samples
	III	*Practical*: Sampling of soil/plants parts and their storage
	IV	*Practical*: Distillation of water Process, Single/Double distilled water
3	I	Preparedness before microbes Handling
	II	*Theory & Practical*: Method for isolation of Microbes from soil/ water samples
	III	*Practical*: Sampling of soil and water samples and their storage
	IV	*Practical*: Working Principle of Laminar flow and UV sterilization
4	Exposure visit	Visit of nearby Institutes and places of historical importance
5	I	Principle and practices of handling of equipments
	II	*Practical*: preparation of cotton plugs for test tube/ flask
	III	*Practical*: Dry and wet sterilization methods
	IV	*Practical*: Autoclaving and hot air oven sterilization
	Valedictory	Feedback & Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercises, discussions on actual problems faced, interaction, and Field/Lab/Exposure visit.

8. Programme Designed, Developed and Organized By:

Director of the Institute : Dr. Anil K. Saxena, Director
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Course Coordinator : Dr. Mageshwaran V., Scientist (Sr. Scale)
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Programme: 6

1. **Title** : **Improving Working Efficiency of Skilled Support Staff**
2. **Organizing Institute** : ICAR-Indian Institute of Farming Systems Research, Modipuram
3. **Objective(s)** :
   - To develop overall efficiency of the skilled employees towards official work
   - To refine technical skill of SSS in field and laboratory work
4. **Duration** : 05 days
5. **Category of employees** : Skilled Support Staff
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural programme & pre- training evaluation
	I	Positive attitude, its effect on behaviour and working efficiency
	II-III	*Practical:* Basic knowledge of computer and its operation
2	I-II	Basic office rules and procedures
	III-IV	*Practical:* Layout and preparation of field for research
3	I-II	*Theory & Practical:* Basic knowledge of farm machineries and implements and their operation
	III -IV	*Theory & Practical:* Nursery production and management of fruit and vegetables crops.
4	Field/Exposure visit	Exposure visit to the nearby Institutes/Universities
	II-III	*Theory & Practical:* Maintenance and safety measures of laboratory
	IV	*Theory & Practical:* Research farm records and its maintenance
5	I-II	*Practical:* Livestock handling and operations, farm records and its maintenance
	III	Theory & *Practical:* Cleanliness, its importance and effect on environment and health of the people.
	Valedictory	Post- training evaluation, Feedback & Valedictory Programme

7. **Pedagogy** : Training programme consisted of lectures, practical exercises, discussions on actual problems faced and interaction, Field/Exposure visits, etc.

8. Programme Designed, Developed and Organized By:

Director of the Institute	:	Dr. A. S. Panwar Email: director.iifsr@icar.gov.in
HRD Nodal Officer	:	Dr. Suresh Malik, Principal Scientist Email: sk1malik@gmail.com
Course Director	:	Dr. Suresh Malik, Principal Scientist Email: sk1malik@gmail.com
Course Coordinator	:	Dr. Raghubir Singh, Scientist Email: rsbicar@gmail.com

Programme: 7

1. **Title** : **Skill Development in Tropical Tuber Crops**
2. **Organizing Institute** : ICAR-Central Tuber Crops Research Institute, Thiruvananthapuram
3. **Objective(s)** :
   - To enhance the know-how on technologies of tropical tuber crops
   - To impart skill on technologies of tropical tuber crops
   - To improve the communication skills for better job performance
4. **Duration** : 04 days
5. **Category of employees** : Skilled Support Staff
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Conduct/service rules of ICAR
	II	*Theory and Practical*: Improved varieties/technologies of tuber crops
	III	*Theory and Practical:* Design and layout of field experiments for tuber crops
2	I	*Theory and Practical:* Importance of quality planting materials and demonstration on mini-sett techniques
	II	Basics of farm management
	III	*Theory and Practical:* Computer applications & e-office -Hands on experiences
	IV	*Theory and Practical:* Record keeping and office maintenance
3	I	*Theory and Practical:* Soil sampling methods and importance of Soil Health Cards
	II	*Theory and Practical:* Hands-on exercises on value addition in tuber crops
	III	Communication skills/team building exercises
	Field/Exposure visit	Visit to museum, experimental plots, biopesticides unit and Techno Incubation Centre
4	Field/Exposure Visit	Visit to ICAR- CPCRI, RS, Kayamkulam, Alappuzha
		Visit to ICAR- KVK, Kayamkulam, Alappuzha
	Valedictory	Feedback & Valedictory Programme

**Practical sessions followed after the theory classes*

7. Pedagogy : Training programme consisted of lectures, practical exercises, discussions on actual problems faced, interaction, and Field/Lab/Exposure visit.

8. Programme Designed, Developed and Proposed By:

Director of the Institute : Dr. V. Ravi
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Course Coordinator(s) : Dr. P. Prakash, Scientist
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Dr. K. M. Senthilkumar, Scientist
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Programme: 8

1. **Title** : **Nursery Management in Arid Region**
2. **Organizing Institute** : ICAR-Central Institute for Arid Horticulture, Bikaner
3. **Objective(s)** :
   - To enhance skill of SSS in nursery related activities
   - To sensitize advance techniques for care and management of saplings
4. **Venue** : CIAH-Central Horticultural Experiment Station, Godhara
5. **Duration** : 04 days
6. **Category of employees** : Skilled Support Staff
7. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I-II	*Theory and Practical:* Budding and grafting in bael and aonla
	III-IV	*Theory and Practical:* Nursery bed preparation and raising of seedlings
2	I-II	*Theory and Practical:* Vegetative propagation of minor fruits
	III-IV	*Theory and Practical:* Nutrient management of nursery plants
3	I-II	*Theory and Practical:* Plug tray nursery raising of vegetables
	III-IV	*Theory and Practical:* Different kind of containers for raising of nursery plants
4	I	*Theory and Practical:* Nursery as a venture for empowering rural women
	II	*Theory and Practical:* Sterilization of vegetable nursery media for raising of healthy transplants.
	III	*Theory and Practical:* IPM in nursery plants
	Valedictory	Feedback & Valedictory Programme

7. **Pedagogy** : Training programme consisted of lectures, practical exercises, discussions, interaction, and Field visit.
8. **Programme Designed, Developed and Organized By**:

Director of the Institute : Prof. (Dr.) P. L. Saroj, Director
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Course Director(s) : Dr. Sanjay Singh (Head)
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Course Coordinator(s) : Dr. V. V. Apparao
Dr. D. S. Mishra, CHES, Godhara
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Programme: 9

1. **Title** : **Nursery Techniques and Management in Eastern Region**
2. **Organizing Institute** : ICAR-Research Complex for Eastern Region, Patna
3. **Objective(s)** :
   - To upgrade the skills of supporting staff in nursery management
   - To sensitize with advance techniques in nursery management
4. **Venue** : ICAR-Research Complex for Eastern Region, Research Centre, Ranchi
5. **Duration** : 3 days
6. **Category of employees** : Skilled Support Staff
7. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Importance of nursery management and techniques
	II	*Theory and Practical:* Advances of techniques and management in fruit plant nurseries
	III	*Theory and Practical:* Grafting and budding techniques in fruit plants
2	Field visit	Visit of commercial hi-tech nursery
	II	*Theory and Practical:* Disease management and potting mixture preparation for nurseries
	III	*Theory and Practical:* Insect pests and nematode management in nurseries
3	I	*Theory and Practical:* Grafting techniques and seedling management in tomato, brinjal and other solanaceous crops
	II	*Theory and Practical:* Nursery raising techniques in vegetable crops
	III	*Theory and Practical:* Nutrient and plant growth hormones management in nursery plants
	IV	*Theory and Practical:* Grafting and nursery management in vegetable crops
	Valedictory	Feedback & Valedictory Programme

7. **Pedagogy** : Training programme consisted of lectures, practical exercises, discussions, interaction, and Field visit.

8. Programme Designed, Developed and Organized By:

Director of the Institute	:	Dr. B. P. Bhatt, Director Email: directoricarrcer2@gmail.com
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Course Director	:	Dr. A. K. Singh, Head ICAR-RCER, RC, Ranchi Email: headicarrcerranchi@gmail.com
Course Coordinator	:	Dr. Jaipal Singh Choudhary, Scientist ICAR-RCER, RC, Ranchi Email: choudhary.jaipal@gmail.com

Programme: 10

1. **Title** : **Nursery Techniques and Farm Management Practices in Plantation crops**
2. **Organizing Institute** : ICAR-Central Plantation Crops Research Institute, Kasaragod
3. **Objective(s)** :
   - To familiarize with the nursery techniques and farm management in coconut, arecanut and cocoa
   - To provide hands-on-training for handling computer
4. **Duration** : 3 days
5. **Category of employees** : Skilled Support Staff
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	*Theory and Practical:* Quality planting materials and nursery management
	II	*Theory and Practical:* Production technologies of coconut, arecanut and cocoa
	III	*Theory and Practical:* Improved varieties of arecanut and cocoa and their planting material production
2	I	Yoga and its health benefits
	II	*Theory and Practical:* Kalparasa production and Value addition in coconut
	III	*Theory and Practical:* Integrated pest & disease management in coconut, arecanut and cocoa
	IV	*Theory and Practical:* Introduction to basic computer application, ICAR-ERP portal and mobile applications
3	Exposure visit	Exposure visit/study tour to ICAR-DCR, Puttur
		Exposure visit to CAMPCO Unit, Puttur
	Valedictory	Feedback & Valedictory Programme

7. **Pedagogy** : Training programme consisted of lectures, practical exercises, discussions, interaction, and Field/Exposure visit.

8. Programme Designed, Developed and Proposed By:

Director of the Institute	:	Dr. Anitha Karun, Director Email: anithakarun2008@gmail.com
HRD Nodal Officer	:	Dr. V. Niral, Principal Scientist Email: niralv@yahoo.com
Course Director	:	Dr. V. Niral, Principal Scientist Email: niralv@yahoo.com
Course Coordinator(s)	:	Dr. Chandran K. P., Principal Scientist Email: chandran.kp@gmail.com Dr. Kadke G. N., Scientist Email: kadke.gn@icar.gov.in

Programme: 11

1. **Title** : **Propagation Techniques and Management of Horticultural Crops in Island Ecosystem**
2. **Organizing Institute** : ICAR-Central Island Agricultural Research Institute, Port Blair
3. **Objective(s)** :
   - To provide hands-on experience on propagation techniques in Island horticultural crops
   - To provide hands on experience on management of Island horticultural crops
4. **Venue** : Division of Horticulture and Forestry
5. **Duration** : 05 days
6. **Category of employees** : Skilled Support Staff
7. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ activity
	Registration	Registration
	Inaugural	Inaugural programme
1	**Hands on Training on Horticultural Plants Propagation**	
	I	Introduction to plant propagation
	Field visit/ Practical	Visit to Horticultural Plant Propagation Unit Preparation of potting mixtures and rooting hormones for various horticultural crops Vegetative propagation of plants through cuttings, layering, grafting
	Field visit/ Demonstrations	Propagation substrates, containers and nursery inputs Grafting in horticultural crops
2	**Hands on Training on Quality Seed and Seedling Production of Plantation Crop Management**	
	I	Introduction to plantation crops
	Practical	Field selection and preparation methods for nursery Nursery techniques & layout and planting techniques Mother palm and quality seed selection, seedling selection in major plantation crops
	Field visit/ Demonstrations	Plantation management Identification of pest and disease and its management Harvesting and post-harvest handling

Day	Session	Topic/ activity
3.	**Propagation and Production Techniques of Flowers and Ornamental Crops**	
	I	Sexual propagation by seeds; Asexual propagation of flowers and ornamentals
	Practical	Potting and repotting of plants; Harvesting and packaging of flowers and ornamental crops
	Field visit/ Demonstrations	Visit to flower production cum demonstration unit
4	**Propagation and Orchard Management of Fruit Crops**	
	Theory & Practical	Establishment of orchards; Orchard cultivation; Cropping, irrigation and nutrient management
	Practical	Farm machinery used in orchards; Nutrient management for fruit orchards
	Field visit/ Demonstrations	Visit to fruit orchard
5	**Hi-Tech Forest Tree Seedling Production Technologies**	
	I	Introduction and importance of tree nurseries
	Practical	Plus tree selection Tools and materials required for good nursery practices and management of tree nurseries; Mother bed preparation, seed sowing, transplanting and management practices for production of elite planting materials Clonal propagation methods
	Field visits/ Demonstrations	Tree plantation and value addition of the plantation
	Valedictory	Feedback and Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercises, discussions on actual problems faced, interaction, and Field visit.

8. Programme Designed, Developed and Proposed By:

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Course Director : Dr. B. A. Jerard, Head
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Programme: 12

1. **Title** : **Skill Development in Orchids**
2. **Organizing Institute** : ICAR-National Research Centre for Orchids, Pakyong, Sikkim
3. **Objective(s)** :
   - To develop skills of Skilled Support Staff working in the Institute
   - To expose SSS to various relevant developments
5. **Duration** : 05 days
6. **Category of employees** : Skilled Support Staff
7. **Course content (day-wise theory and practical course content) :**

Day	Session	Topic/Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	*Practical:* Garden designing and beautification
	II	*Practical:* Landscaping
2	Field Visit I	*Practical:* Orchid conservation – Major characters for species identification
	II	*Practical:* Basics of orchid cultivation
3	I	*Practical:* Basics of laboratory techniques
	II	*Practical:* Handling of minor instruments
	III	*Practical:* Preparation of solutions
4	Field/exposure visit	Visit to BSI, Gangtok, ICAR-NEH Sikkim Centre, Tadong
		Visit to KVK, East Sikkim and Cymbidium Centre, Rumtek
5	I	Visit to Darjeeling Centre, ICAR-NRC for Orchids
	Valedictory	Feedback & Valedictory Programme

7. **Pedagogy** : Training programme consisted of lectures, practical exercises, discussions, interaction, and Field/Exposure visit.
8. **Programme Designed, Developed and Organized By**:

Director of the Institute : Dr. Rampal, Director (Acting)
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Course Coordinator : Sh. S. S. Biswas, Scientist
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Programme: 13

1. **Title** : **Dairy Farm Management**
2. **Organizing Institute** : ICAR-Central Institute for Research on Cattle, Meerut
3. **Objective(s)** :
   - To expose the SSS to various aspects of dairy farm management
4. **Duration** : 03 days
5. **Category of employees** : Skilled Support Staff
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Introduction to organized dairy farm and functions of different units
	II	*Theory & Practical:* Characteristics of good dairy animals and identification of important breeds of dairy cattle
	III	*Theory & Practical:* Importance of housing and housing management for different categories of farm animals
	IV	*Theory & Practical:* Introduction of feedstuffs and production of fodders
2.	Field/ Exposure Visit	Visit to fodder production farm
		Visit to livestock farm and its operations
3.	I	*Theory & Practical:* Washing, cleaning of articles, preparation of artificial vagina, semen collection and handling of frozen semen
	II	*Theory & Practical:* Care and feeding of calves, heifers, lactating and advanced pregnant animals
	III	*Practical:* Methods of milking and clean milk production
	Valedictory	Feedback & Valedictory Programme

7. **Pedagogy** : Training programme consisted of lectures, practical exercises, discussions on actual problems faced, interaction, and Field/Exposure visit.
8. **Programme Designed, Developed and Proposed By**:

   Director of the Institute : Dr. Srikant Tyagi
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Course Coordinator	:	Dr. A. S. Sirohi, Principal Scientist Email: ajaysirohi35@gmail.com

Note: ***Similar type of training modules may be developed and organized by other animal-based Institutes.***

Programme: 14

1. **Title** : **Management of Livestocks, Farm Area and Laboratories**
2. **Organizing Institute** : ICAR-National Research Centre on Camel, Bikaner
3. **Objective(s)**:
   - Awareness about management of livestock, farm area, laboratories and security issues
   - To acquaint the participants about general office procedures
4. **Duration** : 03 days
5. **Category of employees** : Skilled Support Staff
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Responsibilities in livestock farm management
	II	*Theory & Practical:* Precautions, handling and reporting of electrical faults
	III	*Theory & Practical:* Management of animals for exhibition
	IV	*Practical:* Management of library establishment
2	I	*Theory & Practical:* Management issues related to camel dairy
	II	*Theory & Practical:* Storage of animals feed and feed processing
	III	*Practical:* Handling of farm equipment and machinery
	IV	*Theory & Practical:* Handling security related issues
3	I	*Theory & Interaction:* Management of personal savings and taxation
	II	*Theory & Practical:* Management aspects in food testing laboratory
	III	*Theory & Practical:* Precautions in handling and treatment of animals
	IV	Rules governing service related matters
	Valedictory	Feedback & Valedictory Programme

7. **Pedagogy** : Training programme consisted of lectures, practical exercises, discussions on actual problems faced, interaction, and Field/Exposure visit.
8. **Programme Designed, Developed and Organized By**:

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Programme: 15

1. **Title** : **Laboratory Biosafety Practices**
2. **Organizing Institute** : ICAR-National Institute of Veterinary Epidemiology and Disease Informatics, Bengaluru
3. **Objective(s)** :
   - To create awareness regarding the laboratory biosafety working practices in skilled support staff
   - To provide hands-on training on various aspects related to laboratory biosafety
4. **Duration** : 3 days
5. **Category of employees** : Skilled Support Staff
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inauguration and pre-training assessment
	I	Principles of biosafety and biosecurity
	II	*Theory & Practical*: Do's & Don'ts in BSL2+
	III	Work, work responsibilities & working arrangement in BSL2+
	IV	*Practical*: Personal protective equipment (PPE) and their use
	V	*Theory & Practical*: Introduction to disinfection, sterilizers used in BSL2+
2	I	*Theory & Practical*: Cleaning of laboratory floors, work bench, Equipment/ Instrument
	II	*Theory*: Collection, packing & disposal of Laboratory Waste
	III	*Practical*: Hands-on training on collection, packing & disposal of laboratory waste
	IV-V	*Practical*: Hands-on training on washing & cleaning of laboratory glassware / plastic wares
3	I	*Practical*: Packing and sterilization of glassware/plastic wares
	II	*Practical*: Hands-on training on packing and sterilization of glassware/plastic ware
	III	Group discussion to facilitate the implementation strategy by the trainees
	Valedictory	Feedback & Valedictory Programme

7. **Pedagogy** : Training programme consisted of lectures, practical exercises, discussions, interaction, etc.

8. Programme Designed, Developed and Proposed By:

Director of the Institute	:	Dr. Parimal Roy, Director (Acting) Email: director.nivedi@icar.gov.in
HRD Nodal Officer	:	Dr.(Mrs.) Rajeswari Shome, Principal Scientist Email: rajeswarishome@gmail.com
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Course Coordinator(s)	:	Dr. R. Sridevi, Scientist Dr. Manjunatha Reddy, Scientist Dr. Yogisharadhya, Senior Technical Officer

Programme: 16

1. **Title** : **Processing and Storage of Poultry Feed and Products**
2. **Organizing Institute** : ICAR-Central Avian Research Institute (CARI), Izatnagar
3. **Objective(s)** :
   - To impart practical knowledge for poultry feed plant and poultry processing plant
   - Management and handling poultry feed ingredients, compounded feed and produces to ensure good quality
4. **Duration** : 05 days
5. **Category of employees** : Skilled Support Staff
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme and Orientation about the course
	I	Introduction to poultry & its different breeds
	II	Understanding the relevant terms related to poultry, feeds, feeding
	III	*Practical*: Classification and identification of different feed ingredients and their compositions
2	I	*Theory & Practical*: Different types of poultry feed and value added poultry products
	II	*Theory & Practical*: Alternate feed stuffs for poultry feed formulation
	III	*Theory & Practical*: Feeding criteria of different species of poultry
	IV	*Theory & Practical*: Proximate system of analysis for feed and products
3	I	*Theory & Practical*: Adulterants in feeds, poultry products, and physical examination of feeds and feedstuffs
	II	*Theory & Practical*: Different type of storage methods, storage of feedstuffs, feed and poultry feed additives
	III	*Theory & Practical*: Quality control of poultry feeds
	IV	*Practical*: Preparation of different types of poultry feeds
4	Field/Exposure visit	Field visit of locally well-organized farm and feed unit
	II	*Theory & Practical*: Processing operation in feed milling
	III	*Theory & Practical*: Bio-security measures in farm and feed unit
	Field/Exposure visit	Visit & demonstration of feed plant in IVRI; Preparation of pre-mix feed

Day	Session	Topic/ Activity
5	I	*Theory & Practical*: Poultry feed ingredient and feed stock register preparation & record keeping
	II	*Theory & Practical*: Feed processing equipment or machines and how to use them
	III	Feedback and general discussion about the training, Evaluation, reporting
	Valedictory	Feedback & Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercises, discussions on actual problems faced, interaction, and Field/Exposure visit, etc.

8. Programme Designed, Developed and Organized By:

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Course Coordinator : Dr. C. Deo, Principal Scientist
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Programme: 17

1. **Title** : **Poultry Production and Management**
2. **Organizing Institute** : ICAR-Central Avian Research Institute, Izatnagar
3. **Objective(s)** :
   - To introduce the participants about basics of poultry farming & management
   - To deliver hands-on training with regards to research experiments and management
4. **Duration** : 5 days
5. **Category of employees** : Skilled Support Staff
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Introduction to Poultry & its different breeds
	II	*Theory & Practical*: Poultry body parts & bird handling
	Field/Exposure visit	Visit to CARI poultry farm & glimpses of different CARI breeds
2	I	*Theory & Practical*: Hatchery management & care (Fumigation, Incubation and hatching, handling of DOC, wing banding, vaccination, record keeping, etc.)
	II	*Theory & Practical*: Brooding (battery / litter), management of light, feeding, watering, etc.
	III	*Practical*: Demonstration of poultry farm activities - Handling & brooding of DOC, wing/leg banding, debeaking, selection and culling, mortality recording, etc.
	Field/Exposure visit	Visit to CARI hatchery
3	I	*Theory & Practical*: Deep litter & cage management
	II	*Theory & Practical*: Semen collection & insemination
	III	Farm and stress management during various seasons including extreme weather conditions
	Exposure visit	Exposure to different poultry instruments

Day	Session	Topic/ Activity
4	Field/Exposure Visit	Visit to commercial poultry farms
	II	*Theory & Practical*: Introduction to different poultry feed ingredients & feed additives
	III	*Theory & Practical*: Preparation of compound poultry feed, poultry feed storage and FCR calculation
	Field/Exposure Visit	Visit to CARI poultry feed unit & storage facilities; making pre-mix preparation
5	I	*Theory & Practical*: Poultry health management.
	II	*Theory & Practical*: Poultry biosecurity & farm hygiene
	III	*Theory & Practical*: Poultry slaughter study (cut of parts) & processing
	III	*Practical*: Poultry sample & blood collection
	Valedictory	Feedback & Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercises, demonstrations, discussions on actual problems faced, interaction, and Field/Exposure visit etc.

8. Programme Designed, Developed and Organized By:

Director of the Institute : Dr. Sanjeev Kumar, Director (Acting)
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Programme: 18

1. **Title** : **कुशल सहायक कर्मियों के क्षमता संवर्धन हेतु प्रशिक्षण–सह–कार्यशाला**
2. **Organizing Institute** : भाकृअनुप–राष्ट्रीय मत्स्य अनुवांशिक संसाधन ब्यूरो, लखनऊ
3. **Objective(s)** :
   - सहायक कर्मियों के लिए क्षमता का संवर्धन
   - सहायक कर्मियों को अपने कार्यों के प्रति संवेदनशील बनाना
   - संस्थान के उत्तरोत्तर शोध एवं विकास के कार्यों में अपने योगदान को महत्वपूर्ण समझना
4. **Duration** : 3 दिन
5. **Category of employees** : कुशल सहायक कर्मचारी
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/Activity
1	पंजीकरण	पंजीकरण
	उद्घाटन	उद्घाटन कार्यक्रम
	I	वेतन, अग्रिम एवं आयकर संबंधित जानकारी
	II	प्रैक्टिकल : कम्प्यूटर अनुप्रयोग व बेसिक जानकारियां
	III	लेखा परीक्षा अनुभाग से संबंधित व्याख्यान तथा कम्प्यूटर के साथ प्रैक्टिकल अभ्यास
2	I	प्रशासनिक संरचना से संबंधित जानकारी
	II	भण्डार सेक्शन प्रबंधन से संबंधित जानकारी
	III	प्रशासनिक कार्यों में ई–ऑफिस, इंटरनेट व ई–मेल से संबंधित जानकारी
3	I	प्रैक्टिकल : प्रयोगशाला में कार्य के दौरान व्यावहारिक जानकारी व सावधानियाँ, मानव संसाधन विकास व कर्मचारियों के मनोबल बढ़ाने के बारे में जानकारी
	समापन	फीडबैक एवं समापन कार्यक्रम

7. **Pedagogy** : Training programme consisted of lectures, practical exercises, discussions and interaction, etc.
8. **Programme Designed, Developed and Organized By**:

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Programme: 19

1. **Title** : **Training on Computer Literacy**
2. **Organizing Institute** : ICAR-Central Island Agricultural Research Institute, Port Blair
3. **Objectives** :
   - To expose the trainees to basic computer fundamentals and mobile applications
   - To train on data collection, compilation, analysis and reporting techniques on e-mode
4. **Duration** : 5 days
5. **Category of employees** : Skilled Support Staff
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Introduction to operating system
	II	*Practical:* Hands-on practice of file management
	III	*Practical:* Hands-on practice of mobile app
2	I	Overview of the different features of Microsoft Word
	II	*Practical:* Hands-on for typing and formatting
	III	*Practical:* Hands-on for editing, document spacing and margins
	IV	*Practical:* Hands-on for page numbering and saving a document
3	I	Overview of the different features of Microsoft Excel
	II	*Practical:* Hands-on Navigate the Excel User Interface
	III	*Practical:* Hands-on performing calculations and create worksheet formulas
	IV	*Practical:* Hands-on Insert, delete, and adjust cells and columns
4	Field/Exposure visit	Exposure visit to local market for data collection
	Exposure visit	Visit to local vegetable/fish market for data collection
5	I	*Practical:* Compilation of data
	II	*Practical:* Analysis of data
	III	Presentation of data
	Valedictory	Feedback & Valedictory Programme

7. Pedagogy : Training programme consisted of lectures, practical exercises, demonstrations, discussions on actual problems faced, interaction, presentation and Field/Exposure visit, etc.

8. Programme Designed, Developed and Proposed By:

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Course Director : Dr. S. K. Zamir Ahmed, I/C Social Science Section,
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Programme: 20

1. **Title** : **Computer Application for Skill Enhancement**
2. **Organizing Institute** : ICAR-Central Research Institute for Jute and Allied Fibres, Barrackpore
3. **Objective(s)** :
   - To promote computer literacy among Skilled Support Staff and acquaint them with various applications of computer
   - To sensitize the trainees about MIS-FMS
4. **Duration** : 04 days
5. **Category of employees** : Skilled Support Staff
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Basics of computer system and information technology
	II	*Practical:* Hardware, software, input-output devices, etc.
	III	*Theory & Practical:* Networking, internet and local area networking
2	I	*Practical:* Electronic Mail System: Introduction and creation of individual mail id using free domain
	II	*Theory & Practical:* Operating system concepts
	III	*Theory & Practical:* Application software ideas (Microsoft Office)
3	I	*Practical:* Introduction to ICAR and CRIJAF website
	II	*Theory & Practical:* MIS-FMS: Brief Introduction with leave, joining report and payslip generation
	III	*Practical:* Hands-on Training in AKMU lab
	IV	Evaluation of participants & feedback
4	Exposure Visit	Exposure visit to AKMU Cell and other facilities of CRIJAF
	Valedictory	Feedback & Valedictory Programme

7. **Pedagogy** : Training programme consisted of lectures, practical exercises, demonstrations, discussions, interaction, and Exposure visit, etc.

8. Programme Designed, Developed and Organized By:

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HRD Nodal Officer	:	Dr. Pratik Satya, Principal Scientist Email: pscrijaf@gmail.com
Course Director	:	Dr. A. K. Chakraborty, Scientist (SS) Email: Asim.Chakraborty@icar.gov.in
Course Coordinator	:	Dr. Dhananjay Barman, Sr. Scientist Email: Dhananjay.Barman@icar.gov.in

Programme: 21

1. **Title** : **Awareness about General Administration, Finance and e-Office**
2. **Organizing Institute** : ICAR-ATARI, Zone VII, Umiam, Meghalaya
3. **Objective(s)** :
   - To provide knowledge on guidelines and various dimensions of general administrative, financial and e-Office management
   - To enhance knowledge and behavioural skills of SSS for effective communication and personality development
4. **Duration** : 03 days
5. **Category of employees** : Skilled Support Staff
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
I	Registration	Registration
	Inaugural	Inaugural Programme
	I	Introduction to training functions & training needs
	II	Awareness of general administration, finance, accounts and record keeping
	III	A special insight into oral communication
	IV	Motivation and personality development
II	I	Conduct rules
	II	Importance of e-office and current trends
	III	*Practical:* Receiving DAK dispatch and record keeping
	IV	Communication skills and work ethics
	V	*Practical:* Laboratory safety measures
III	I	Cleanliness in office and hygiene management and up gradation of office
	Exposure visit	Visit to nearby Institutes
	III	Feedback & Valedictory Programme

7. **Pedagogy** : Training programme consisted of lectures, practical exercises, demonstrations, discussions on actual problems faced, interaction, and Exposure visit, etc.

8. Programme Designed, Developed and Organized By:

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HRD Nodal Officer	:	Dr. Rajumoni Bordoloi, Principal Scientist Email: rmbshl@gmail.com
Course Director	:	Dr. A. K. Singha, Principal Scientist Email: aksingha0101@gmail.com
Course Coordinator	:	Mrs. Amurtha T., Scientist Email: amurthakbh@gmail.com

Programme: 22

1. **Title** : **Diary, Dispatch and Record Management**
2. **Organizing Institute** : ICAR-Indian Institute of Maize Research, Ludhiana
3. **Objective(s)** :
   - To train SSS with the procedure of diary and dispatch
   - To make SSS conversant with the process of record management in office
4. **Duration** : 03 days
5. **Category of employees** : Skilled Support Staff
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	*Theory & Practical:* Introduction to working with computers and scanning software
	II	*Practical:* Computer typing
	III	*Practical:* Use of scanning software
2	I	*Practical:* Introduction to file movement in office work
	II	*Practical:* Diary of the received DAK
	III	*Practical:* Making entries in the dispatch register
	IV	*Practical:* Making entries in peon book
3	I	*Practical:* Record management of diary and dispatch registers
	II	*Practical:* Tracing record in diary register
	III	*Practical:* Tracing record in dispatch register
	Valedictory	Feedback & Valedictory Programme

7. **Pedagogy** : Training programme consisted of lectures, practical exercises, demonstrations, discussions, and interaction, etc.
8. **Programme Designed, Developed and Organized By**:

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Course Coordinator : Dr. Mukesh Choudhary, Scientist
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Programme: 23

1. **Title** : **Awareness about General Office Procedures**
2. **Organizing Institute** : ICAR-Central Potato Research Station, Regional Station, Gwalior
3. **Objective(s)** :
   - To acquaint SSS with office procedures and general etiquettes
4. **Duration** : 3 days
5. **Category of employees** : Skilled Support Staff
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural programme
	I	*Practical:* Filling of application for leave
	II	*Practical:* Pension and related issues
	Field/Exposure visit	Visit to the field and labs to know various work being taken up
2	I	Maintenance of building, importance of cleanliness, arranging file and noting on files
	II	Procedures followed in the office
	III	Filling GPF, LTC and medical forms and discussion on related issues
3	I	Discussion and interaction on various administrative matter of interest
	Field/Exposure visit	Visit to nearby Institutes
	Valedictory	Feedback & Valedictory Programme

7. **Pedagogy** : Training programme consisted of lectures, practical exercises, demonstrations, discussions, interaction, and Field/Exposure visit, etc.
8. **Programme Designed, Developed and Organized By**:

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Course Coordinator : Dr. S. P. Singh, Principal Scientist
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Programme: 24

1. **Title** : **Awareness about Service Rules**
2. **Organizing Institute** : ICAR-National Research Centre on Yak, Dirang
3. **Objective(s)** :
   - To aware Skilled Support Staff on various service rules
   - To acquaint the participants about Sexual Harassment at work place
4. **Duration** : 3 days
5. **Category of employees** : Skilled Support Staff
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Discipline rules
	II	Conduct rules
	III	Leave rules
	IV	Central Govt. hospital scheme
2	I	Advances
	II	Allowances
	III	Provident fund
	IV	Seniority and Promotion
3	I	Income tax
	II	Deputation and foreign service
	III	Sexual harassment at work place
	Valedictory	Feedback & Valedictory Programme

7. **Pedagogy** : Training programme consisted of lectures, exercises, discussion, interaction, etc.
8. **Programme Designed, Developed and Organized By**:

Director of the Institute : Dr. S. M. Deb, Director
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Programme: 25

1. **Title** : **Skill Upgradation in Good Office Practices-cum-General Awareness**
2. **Organizing Institute** : ICAR-Directorate of Weed Research, Jabalpur
3. **Objective(s)** :
   - To enhance knowledge of Skilled Support Staff
   - To improve job related skills of Skilled Support Staff
   - To develop proper job-related attitudes in Skilled Support Staff
4. **Duration** : 03 days
5. **Category of employees** : Skilled Support Staff
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	*Theory & Practice:* Effective communication skills
	II	Basic Information Technology and computer skills
	III	*Theory & Practice:* Art of public speaking
2	I	*Theory & Practice:* Telephone skills
	II	*Theory & Practice:* Inter-personnel skill development
	III	*Theory & Practice:* Personal hygiene
	IV	Team building exercises
3	I	*Theory & Practical:* Lab management
	II	Physical and Mental health management
	Field/Exposure Visit	Visit to the Institute fields and labs
	Valedictory	Feedback & Valedictory Programme

7. **Pedagogy** : Training programme consisted of lectures, practical exercises, demonstrations, discussions, interaction, and Field/Exposure visit, etc.
8. **Programme Designed, Developed and Organized By**:

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Er. Chethan C. R., Scientist
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Programme: 26

1. **Title** : **Health Management and Good Office Practices**
2. **Organizing Institute** : ICAR-Central Research Institute for Jute and Allied Fibres, Barrackpore
3. **Objective(s)** :
   - To sensitize SSS on health related issues
   - To train SSS on good office practice
4. **Duration** : 03 days
5. **Category of employees** : Skilled Support Staff
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Knowing the duties of Skilled Support Staff and performing them
	II	*Theory & Practice:* General cleanliness & upkeep of the section/unit
	III	*Practical:* Photocopying, sending of FAX, etc. with technical knowledge and maintenance of the photocopier/fax/intercom, etc.
	IV	*Practical:* Basic handling of computer (Switching On/Off, transferring file from one location to other, printing of matters etc.)
	V	*Practical:* Behavioural and communication skills including mock drill
2	I	*Theory & Practical:* Health and hygiene management in officer and administer first aid
	Mock drill	Mock drill against fire hazards
	Field/Exposure Visit	Study tour for gaining basic knowledge on gardening and floriculture
3	Field/Exposure Visit	Study tour to ICAR-CIFRI, Barrackpore
	Feedback	Feedback from participants
	Valedictory	Valedictory Programme

7. **Pedagogy** : Training programme consisted of lectures, practical exercises, demonstrations, discussions, interaction, and Field/Exposure visit, etc.
8. **Programme Designed, Developed and Organized By**:

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Course Director : Mr. Pradyumna Kumar Jain, Chief Administrative Officer
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Programme: 27

1. **Title** : **Enhancing Personal Effectiveness for Job Performance**
2. **Organizing Institute** : ICAR-Indian Agricultural Research Institute, New Delhi
3. **Objective(s)** :
   - To create understanding among the supporting staff about the workplace behaviour and effectiveness
   - To sensitize them about the soft skills essential to manage better at workplace
4. **Venue** : Division of Agricultural Extension, IARI, New Delhi
5. **Duration** : 03 days
6. **Category of employees** : Skilled Support Staff

Day	Session	Topic/Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	Self-motivation
	II	Understanding self
	III	Personal effectiveness
2	I	Understanding personal strengths & blocks
	II	Communication skills
	III	Etiquettes
3	I	Team building
	II	Stress management
	III	Gender sensitization & POSH
	Valedictory	Feedback & Valedictory Programme

7. **Pedagogy** : Training programme consisted of lectures, practical exercises, discussions and interaction, etc.
8. **Programme Designed, Developed and Organized By**:

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Programme: 28

1. **Title** : **Enhancing Efficiency and Behavioural Skills**
2. **Organizing Institute** : ICAR-National Bureau of Plant Genetic Resources, New Delhi
3. **Objective(s)** :
   - To acquaint the SSS with office procedures, rules and regulations
   - To acquaint the SSS with the operation and handling of office equipments
   - To upscale behavioural skills of SSS
4. **Duration** : 04 days
5. **Category of employees** : Skilled Support Staff
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural session
	II	Value & ethics/communication skills with higher officers/ staff
	III	Service rule awareness including allowances like GPF, Transport, HBA, Computer, etc.
	III	*Practice:* Diary, dispatch, office record keeping and maintenance
	IV	Health issues and Swacchta Abhiyan
2	I	*Practice:* Handling of office automation devices such as computer, photocopier, fax machine and multi-media projector, etc.
	II	*Practical:* Hands-on training for submitting on-line applications for casual leave, earned leave and other service functions, etc. in ICAR - ERP system
	III	Administrative Vigilance
	IV	Self-motivation and inter-personal skills for service delivery
3	Exposure visit	Visit to CSSRI, Karnal and IIWBR, Karnal
4	I	Stress, time and conflict management
	II	Service rule awareness – retirement benefits
	III	Service rule awareness – TA/TTA, LTC and CGHS benefits
	IV	Feedback & Valedictory Programme

7. **Pedagogy** : Training programme consisted of lectures, practical exercises, discussions, and interaction, Exposure visit, etc.

8. Programme Designed, Developed and Organized By:

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Programme: 29

1. **Title** : **Personality Development and Enhancement of Work Efficiency**
2. **Organizing Institute** : ICAR-National Dairy Research Institute, Karnal
3. **Objective(s)** :
   - To develop personality and confidence of SSS at work place
   - To enhance work efficiency and competency of SSS
   - To motivate positively towards work
4. **Duration** : 3 days
5. **Category of employees** : Skilled Support Staff
6. **Course content (day-wise theory and practical course content):**

Day	Session	Topic/ Activity
1	Registration	Registration
	Inaugural	Inaugural Programme
	I	*Practical:* Maintenance of office records/ dispatch diary, etc.
	II	Importance of personal hygiene for good working environment
	III	*Practical:* Public speaking and good manners
	IV	Importance of positive thinking
2	I	*Practical:* Public speaking with confidence
	II	*Practical:* Glassware cleaning and disposal of laboratory waste
	III	*Practical:* Handling the research animals
	IV	Service rule
	V	*Practical:* Basic computer and online skill
	VI	*Practical:* Healthy body for better life (Yoga class)
3	Field/Exposure Visit	Visit to nearby Institute (Extension Education Institute, Nilokheri)
		Visit to University like Kurukhsetra University
	Valedictory	Feedback & Valedictory Programme

7. **Pedagogy** : Training programme consisted of lectures, practical exercises, discussions, and interaction, Field/Exposure visit, etc.

8. Programme Designed, Developed and Proposed By:

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Course Director	:	Dr. Anjali Agarwal, Principal Scientist Email: anjaliaggarwal23aa@gmail.com
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"You get best out of others when
you give the best of yourself..."

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