Diploma in Agriculture

Syllabus

With effect from 2021-22

School of Agriculture and Animal Sciences
The Gandhigram Rural Institute
(Deemed to be University)
Gandhigram – 624302 Tamil Nadu

SCHOOL OF AGRICULTURE AND ANIMAL SCIENCES

DIPLOMA IN AGRICULTURE

INTRODUCTION

This School was offering a two year Certificate course in Agricultural Science from 1956 under the auspices of National Council for Rural Higher Education, Ministry of Education, Govt. of India, New Delhi till 1980. After the introduction of 10+2 pattern of education in Tamil Nadu in 1980, it was felt necessary to restructure the Certificate course in Agricultural Sciences with the object of giving higher training and admitting students with higher general educational qualification. Hence, the syllabus content of Certificate course was so modified to make it as Diploma course in Agriculture and the course was started in the academic year 1980-1981 and continues. The syllabus has been revised once in three years to accommodate the recent developments in the agriculture field.

DETAILS OF THE COURSE

Name of the course	:	Diploma in Agriculture
Duration of the course	:	2 years (4 semesters)
No. of students to be admitted during the year 2021-22	:	30
Eligibility	:	A Pass in H.Sc. examination with Biology / Botany in Academic stream or in vocational stream withBiology and Agriculture Practices.
***Admission Procedure**	:	Academic Stream 95% / Vocational Stream 5 % ** Community Reservation as per GRI Rules.*

OBJECTIVES

1. Impart skills on different agricultural and allied subjects
2. To create confidence among students to undertake farming on their own.
3. To assist them get employment in Government, Non Governmental and Private Organizations.

SYLLABUS PATTERN

The syllabus pattern is furnished in Annexure. The syllabus for individual subjects has been prepared semester wise. Choice Based Credit System (CBCS) is followed.

ASSESSMENT

Each theory-cum-practical course will have a maximum score of 150 with 100 for theory and 50 for practicals, the ratio between CFA and ESE for theory being 40:60 and practicals being 50:50.

EXPERIENTIAL LEARNING THROUGH FIELD EXPOSURE

The students would have to undergo experiential learning by placing them with farmers of Krishi Vigyan Kendra for individual crops for that season. The students will be attached to the farmers of Front Line Demonstration schemes of various crops. For getting exposure to cereals, millets, vegetables, fruits and flowers, progressive farmers of KVK will adopt them for practical field exposure, apart from attending the regular practical farm activities in the Faculty's Farm, Orchard and Dairy. They should keep and update the records for their crop and animal based activities

SCHOOL OF AGRICULTURE AND ANIMAL SCIENCES

Diploma in Agriculture Programme
Scheme of Examinations

Code No	Subject	Credit			Total Marks	Scheme			
						Theory		Practical	
		T	P	Total		CFA	ESE	CFA	ESE
	I Semester								
21AGD0101	Soil and Nutrient Management	3		3	100	40	60		
21AGD0102	Soil and Nutrient Management - practical		1	1	50			25	25
21AGD0103	Principles of Agronomy	3		3	100	40	60		
21AGD0104	Principles of Agronomy - practical		1	1	50			25	25
21AGD0105	Agricultural Meteorology and Land Use Systems	3		3	100	40	60		
21AGD0106	Agricultural Meteorology and Land Use Systems - practical		1	1	50			25	25
21AGD0107	Irrigation Agronomy	3		3	100	40	60		
21AGD0108	Irrigation Agronomy - practical		1	1	50			25	25
21AGD0109	Dairy Cattle Production	3		3	100	40	60		
21AGD0110	Dairy Cattle Production - practical		1	1	50			25	25
21AGD0111	Rural Development	3		3	100	40	60		
21AGD0112	Rural Development - practical		1	1	50			25	25
	Total	**18**	**6**	**24**	**900**				
	II Semester								
21AGD0201	Agronomy of Field Crops - I	3		3	100	40	60		
21AGD0202	Agronomy of Field Crops – I - practical		1	1	50			25	25
21AGD0203	Fundamentals of Plant Protection	3		3	100	40	60		
21AGD0204	Fundamentals of Plant Protection - practical		1	1	50			25	25
21AGD0205	Introduction to Horticulture and Fruit Production	3		3	100	40	60		
21AGD0206	Introduction to Horticulture and Fruit Production - practical		1	1	50			25	25
21AGD0207	Environmental Science and Organic Farming	3		3	100	40	60		
21AGD0208	Environmental Science and Organic Farming - practical		1	1	50			25	25
21AGD0209	Dairy Technology	3		3	100	40	60		
21AGD0210	Dairy Technology - practical		1	1	50			25	25
21AGD0211	Principles of Plant Breeding and Seed Science Technology	3		3	100	40	60		
21AGD0212	Principles of Plant Breeding and Seed Science Technology - practical		1	1	50			25	25
	Total	**18**	**6**	**24**	**900**				
	III Semester								
21AGD0301	Agronomy of Field Crops – II	3		3	100	40	60		
21AGD0302	Agronomy of Field Crops – II - practical		1	1	50			25	25
21AGD0303	Crop Disease Management	3		3	100	40	60		
21AGD0304	Crop Disease Management - practical		1	1	50			25	25
21AGD0305	Vegetable Production	3		3	100	40	60		
21AGD0306	Vegetable Production - practical		1	1	50			25	25
21AGD0307	Farm Power and Machinery	3		3	100	40	60		

21AGD0308	Farm Power and Machinery - practical		1	1	50			25	25
21AGD0309	Introduction to Agricultural Extension	3		3	100	40	60		
21AGD0310	Introduction to Agricultural Extension - practical		1	1	50			25	25
21AGD0311	Agricultural Economics	3		3	100	40	60		
21AGD0312	Agricultural Economics - practical		1	1	50			25	25
21AGD0313	Village Placement Programme*	0	4	4	100				
	Total	**18**	**6**	**24**	**900**				
	IV Semester								
21AGD0401	Farm Management	3		3	100	40	60		
21AGD0402	Farm Management - practical		1	1	50			25	25
21AGD0403	Crop Pests and their Management	3		3	100	40	60		
21AGD0404	Crop Pests and their Management - practical		1	1	50			25	25
21AGD0405	Floriculture and Plantation Crops	3		3	100	40	60		
21AGD0406	Floriculture and Plantation Crops - practical		1	1	50			25	25
21AGD0407	Bio inoculants in Agriculture	3		3	100	40	60		
21AGD0408	Bio- inoculants in Agriculture - practical		1	1	50			25	25
21AGD0409	Livestock and Chicken Production	3		3	100	40	60		
21AGD0410	Livestock and Chicken Production - practical		1	1	50			25	25
21AGD0411	Extension communication for Transfer of technology	3		3	100	40	60		
21AGD0412	Extension communication for Transfer of technology - practical		1	1	50			25	25
	Total	**18**	**6**	**24**	**900**				

Note:* V.P.P. marks will not be considered for the calculation of GPA & CGPA.

IV SEMESTER

21AGD0407 BIO- INOCULANTS IN AGRICULTURE (3+1)

OBJECTIVES

- To teach about the importance of bio-inoculants in Agriculture
- To familiarize students with the microbes used as bio fertilizers for various crop plants
- To give hands on training on the production of bio fertilizers

LEARNING OUTCOME

- The students will be able to isolate various microbes used in microbial inoculants in Agriculture and know the process of mass multiplication of bio- inoculants.
- The students will be able to demonstrate the methods of application of biofertilizers .
- The students will be able to apply quality control procedures to check the quality of biofertilizers

THEORY

UNIT I **Introduction**: General introduction of the microbes used as bioinoculants for crop plants and their advantages. History of Bioinoculants, types of bioinoculants – Bacterial, Fungal, Algal and Actinorhizal- Nitrogen fixation – Biological nitrogen fixation- symbiotic and non symbiotic nitrogen fixation- Scope and Importance of Biofertilizers- Uses of Biofertilizers-

UNIT II **Bacterial Nitrogen Fixation**; *Bacterial nitrogen fixers*- Types - Nodule formation and N_2 fixation – Benefits in Agriculture- Strain selection, sterilization, growth and fermentation, mass production of carrier based and liquid biofertilizers

UNIT III **Fungal & Cyanobacterial Bioinoculants**

Mycorrhizae- types of mycorrhizae- Benefits - 'P' mobilizers – P solubilizers – Mechanism of 'P' mobilization and solubilization - Mass inoculum production of AM fungi - Cyanobacterial Biofertilizers – Types and characteristics - Association with Azolla - Isolation, characterization, mass multiplication - Benefits and role in rice cultivation - Field application

UNIT IV .**Other Biofertilizers**

Importance and uses of silicate, potassium and zinc solubilizers – microorganisms involved, plant growth promoting Rhizobacteria, composting bioinoculants

UNIT V **Quality control of Biofertilizers**. Selection and application for seeds, seedlings, tubers, sets etc. Properties of good quality biofertilizer formulation- Biofertilizers -Storage, shelf life, quality control, FCO specifications, Recommendation and dosage for various crops- Factors influencing the efficacy of biofertilizers.

PRACTICAL SCHEDULE

1. Isolation and identification of *Rhizobium* from root nodules
2. Inoculum production of bacterial biofertilizers
3. Preparation of carrier based formulation
4. Preparation of liquid formulation
5. Requirements for a biofertilizer production unit
6. Isolation of AM fungi -Wet sieving method method
7. Isolation of AM fungi - sucrose gradient method
8. Mass production of AM inoculants
9. Percent colonization of roots by AM fungi
10. Isolation of blue green algae from soil and water samples
11. Small scale cultivation of Azolla
12. Plant growth promoting Rhizobacteria
13. Compost accelerators
14. Evaluation of growth and quality criteria of Biofertilizers
15. Visit to biofertilizers production unit

REFERENCES

Text Books

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3. Alexander, M. 1985. *Introduction to Soil Microbiology*, John Willey and Sons
a. Inc. N. Y. and London
4. Rangaswami, G. and D. J. Bagyaraj, 1999. *Agricultural Microbiology***,** Asia
a. Publishing House, New Delhi.
5. Wicklow, D.T. and B.E. Soderstrom. 1997, *Environmental and Microbial Relationships*. Springer ISBN.
6. Kannaiyan, S. (2003). *Biotechnology of Biofertilizers*, CHIPS, Texas.
7. Mahendra K. Rai (2005). *Hand book of Microbial Biofertilizers*, The Haworth Press, Inc. New York.

IV SEMESTER

21AGRD0411 EXTENSION COMMUNICATION FOR TRANSFER OF TECHNOLOGY (3+1)

OBJECTIVES

- To expose the students to various extension teaching methods and audio-visual aids
- To impart skill in the application of extension methods and audio-visual aids to specificsituations and subjects
- To impart skill in the planning, preparation and use of various visual aids and modern gadgets.

LEARNING OUT COME

- Studying the classification extension teaching methods and audio-visual aids
- Learning about the different extension methods belonging to individual and group contact
- Learning about the different mass contact methods
- Learning about various audio and visual aids

THEORY

UNIT I **Introduction:** Extension teaching methods - meaning, functions and classification according to form and use, functions and stages of ID process. Audio-visual aids- definition, purpose, merits and demerits.. Classification of audio-visual materials according to evolution, senses involved and contribution to learning. Planning, preparation, presentation and evaluation of audio-visual aids.

UNIT II **Individual and group contact methods:** Farm & Home visit, office call, telephone call, personal letter, e-mails, observation plots, result demonstration and agri-clinics. Method demonstration, General meetings- lecture, debate, symposium, panel, forum, buzz session, brainstorming, seminar and workshop. Group discussion and field trips.

UNIT III **Mass contact methods:** Farm journalism- scope and functions. Publications-leaflet and folder, extension journals, newspaper, extension bulletins, newsletter and circular letter. Radio, television, exhibition, campaign, farmers' fairs, Agrl. Film shows, extension talk, drama, puppet show and folk songs.

UNIT IV **Audio and Visual aids:** Audio aids-Radio, types of audio-recording, tape

recorder, CDs, DVDs, and public address system. Visual aids-Literature, symbolized- charts and graphs. Three dimensional- models, specimens and objects. Two-dimensional-non-projected- photographs, still pictures, chalk board, flash cards and flannel graph. Projected- slides, power point. Slide, Over Head and Opaque projectors.

UNIT V **Audio-visual aids:** Audio-visual- television, film shows, Movie projector. Video projectors- CRT, LCD and DLP. Drama, puppet show, folk dance and folk songs. Modern information technology- E- mail, Internet browsing, Information kiosks, Teleconferencing, Search engines, Directories, online journals, websites and computer networks. MS Power Point - Creating Presentations and Slides. Agri portals, VKC, Mobile phones, Expert systems, social media, WhatsApp and Mobile Applications. Factors to be considered in the selection and combination of extension methods and audio-visual aids. Influence of extension teaching methods.

PRACTICAL SCHEDULE

1. Practicing with lecture, debate and symposium methods.
2. Steps to be followed in the conduct of result and method demonstrations.
3. Organizing and conducting group discussions
4. Preparation of Poster.
5. Preparation of flash cards.
6. Preparation of still pictures.
7. Preparation of charts and graphs.
8. Writing for leaflet, folder and news articles.
9. Planning and preparation of news stories and success stories
10. Practicing with the use of different projectors.
11. Operation and handling of digital and video camera.
12. Participating in farmers' day celebrations.
13. Visit to Information kiosk and Kissan call centres
14. Preparation of power point presentations.
15. Internet browsing and E-mail communication- practice
16. Final practical Examination

REFERENCES

Text books

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3. Dahama, O.P. and O.P.Bhatnagar. 1996. Education and Communication forDevelopment.
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6. Ray, G.L. (2006). Extension Communication and Management Naya Prakashan, Kolkatta.
7. Saxena, S. 2003. MS.OFFICE 2000 for every one. Vikas Publishing House, New Delhi.
8. Seetharaman, Netaji. R., et.al. 1990. A Manual on Audio-visual Aids.
9. Yella Reddy, N. (1998). Audio-Visual Aids for Teaching, Training and Extension. Haritha PublishingHouse, Hyderabad.