

**SHRI GOVIND GURU UNIVERSITY,  
GODHRA**



**Faculty of Arts**  
**Syllabus for**  
**MRS**  
**(Master of Rural Study)**

Choice Based Credit System

With Effect From: 2022-23

# **SHRI GOVIND GURU UNIVERSITY, GODHRA**

## **ORDINANCES, RULES & COURSE OF STUDY FOR THE DEGREE MASTER OF RURAL STUDIES - M.R.S.**

M.R.S. is two years Master's Degree course distributed in four semesters. The core objective of this course is to study and develop agriculture in rural areas especially tribal rural areas; helping them by providing scientific knowledge to practice integrate agricultural with modern and time proven ancient techniques and to help developing strong rural community with special focus to tribal community.

### **O.M.R.S. - 1:**

A candidate for the degree of Master of Rural Studies must be a graduate / Bachelor Degree holder of this university or any other university / institution recognized by UGC/AIU.

Those who have passed the Bachelor degree with at least one subject either from (Agronomy / Horticulture / Animal Husbandry / Dairy Sciences / Veterinary Sciences / Education / Sociology / Economics / Tribal Culture / Rural Studies or allied subject) will be given first preference. However, core course will be allocated based upon the subject studied in respective qualifying degree.

The remaining seats if vacant can be filled with ordinary other candidates. They will only be offered Rural Extension as core subject.

### **O.M.R.S. - 2:**

Admission to first semester M.R.S. will be granted to an applicant who is eligible to apply for admission to first semester M.R.S. as per O. M.R.S. -1 strictly in order of merit determined on the basis of marks. Preference will be given to those who have passed qualifying Examination in the immediately preceding year and along with subjects mentioned in O.M.R.S.-1. Reservation policy as per the government and the university directives shall be applied.

**O.M.R.S. - 3:**

An affiliated college or institution conducting M.R.S., course shall have to earmark 10 acres of land of conducting field experiments.

**O.M.R.S. - 4:**

An affiliated college or institution conducting M.R.S., course will not be allowed to admit more than 60 students to First semester M.R.S. Course as per the university norms.

**O.M.R.S. - 5:**

Medium of instruction & examination shall be Gujarati.

**O.M.R.S. - 6:**

To be eligible for grant of degree of Master of Rural Studies the candidate has to complete all the courses prescribed in the scheme here annexed and to submit the required assignment, dissertation, field reports etc. as prescribed by the university in the syllabus and to appear in the exams conducted by the colleges and the university in manner prescribed here under and pass with minimum credit / marks prescribed to the components there to.

**The further rules are as below.**

**Rules:**

**R.M.R.S. - 1**

The duration of this course will be of two years divided into four semesters. This will be full time course and candidate admitted to this course will not be allowed to join any other courses simultaneously.

**R.M.R.S. - 2**

The candidate admitted to First semester M.R.S. will be eligible to appear at the university examination provided he / she fulfills the following conditions.

She/he fulfills conditions of minimum attendance as laid down in Ordinance of the Shri Govind Guru University and completes required courses and filed works / labour work; and submits required assignments, reports and dissertations as prescribed under course of study.

### **R.M.R.S. - 3**

The Scheme of examination and distribution of marks for the various subjects of study at the First, Second, Third, and Fourth Semester M.R.S. Examinations under two years course will be as shown in the course structure annexed here under.

### **R.M.R.S. - 4**

Candidates desirous of appearing at the Semester End Examination must forward their applications in the prescribed form accompanied by a certificate of attendance to the Registrar, through the Principal of the College on or before the date prescribed for the purpose under the relevant Ordinance.

### **R.M.R.S. - 5**

The CBCS is not only student centric in the teaching-learning processes but is also their evaluation process. In CBCS, the evaluation process is divided into two parts under the CBCS.

The first part consists of Internal Continuous Evaluation (ICE) and the second part consists of the Semester End Examination. The division of marks between the two shall be as per the scheme annexed here under and the evaluation process shall follow the norm that the faculty, who teaches the course, shall conduct the Internal Evaluation (ICE) and the Semester end examination (SEE). The concerned faculty shall be accountable for transparency and reliability of the entire evaluation of the student in the concerned Course.

There shall be 3 types of courses. Foundation; Core and Multi Disciplinary Electives. The credits of each type of courses are annexed here with. Foundation courses need to be completed successfully, however they do not carry any credits in final evaluation.

#### **5.1 The framework for Evaluation & Marking Scheme**

Although assessment and evaluation process in CBCS is in continuous mode, for the purpose of finally letting the candidate know his/her progress periodically, an assessment is divided into four discrete components for reporting the scores to the student as earned by him or her. The details of the Continuous Assessment are summarized in the Table below:

### Papers with Practical Component

Component	Units Covered	Mode of Evolution	Weightage
Internal Continuous Evolution			
Unit Test	Overall 100%	Written Paper	10
Assignment	Overall 100%	Assignment / Class Performance	10
Seminar / Quiz	Overall 100%	Seminar / Quiz	10
Practical Evolution			
Practical	Overall 100%	Practical	20
University Semester End Exam			
Semester End Exam	Overall 100%	Written Paper	50

5.1.1 The university and / or college exam committee shall decide and communicate the method of evolution to the students at beginning of semester.

5.1.2 The internal continuous evolution shall be complete in line with completion of semester; it should be ideally completed 2 weeks before commencement of semester end exam.

5.1.3 To pass internal continuous evolution a student has to secure minimum 12 out of 30 marks.

#### **5.2 Semester End Examination (SEE)**

Semester end exam shall be conducted by the university at end of semester. The prescribed forms shall be issued by the university are to be filled by the student and forwarded to the university through respective college in order to appear for semester end examination.

5.2.1 The student needs to fulfill the eligibility criteria of the university in order to fill the semester end exam form.

5.2.2 The duration of the semester-end examination shall be two hours.

5.2.3 A question paper for semester end shall be set by the university in way it comprehensively tests the knowledge and ability of the student.

5.2.4. Weightage of Semester End Examination shall be 50% for all subjects.

#### **5.3 Structure of Semester End Exam**

There shall following structure of Semester End Exam.

5.3.1. In subjects/papers with 50 marks; semester end exam shall be of 2 hours.

5.3.2 To pass SEE external exam student has to secure minimum 20 marks out of 50 marks.

5.3.3. There shall be no SEE exam for foundation courses. But the college shall conduct continuous evolution / internal assessment (30 marks), seminar / tutorial / practical workshop (20 marks) and term end theory exam (50 marks). Total 100 marks shall be allotted to foundation courses, but they will not carry any credits.

5.3.4 In all papers; all the units of syllabus should be equally weighted, unless and otherwise indicated and respective units shall be covered under respective question.

5.3.5 Following shall be the structure of 50 marks question paper.

Sr.	Question No	Type	Part of Syllabus	Marks
1	1	Descriptive / Essay	Initial 25%	10
OR	1	Descriptive / Essay	Initial 25%	
2	2	Descriptive / Essay	Next 25%	10
OR	2	Descriptive / Essay	Next 25%	
3	3	Descriptive / Essay	Penultimate 25%	10
OR	3	Descriptive / Essay	Penultimate 25%	
4	4	Descriptive / Essay	Ultimate 25%	10
OR	4	Descriptive / Essay	Ultimate 25%	
5	5	MCQ or Short Answers	Overall	10

#### **5.4 Practical Examination:**

Practical examination (wherever applicable) shall be conducted at the end of everysemester. The examination shall be conducted as per norms decided by the concerned authority ofthe university. Controller of Examination shall announce policy for the practical examination inadvance and it shall be made known to the students also in advance. There shall be no separate syllabus for practical exam. In certain subjects indicative list of practical is provided for references, only.The syllabus for respective subject itself shall be used for conducting practical exam.

There shall be 20 marks allotted for practical exam, out of which 10 marks shall be reserved for practical work carried out during semester (journal/report)

and 10 marks for exam task (5 for task + 5 for viva voce.). To pass the practical exam student has to secure minimum 8 marks out of 20 marks.

**5.5 Passing Requirements:**The student has to secure following marks in each component to pass the required subject.

5.5.1 In all core and MDC subjects, student needs to secure minimum 40% marks in each exam component to pass. Further, the student needs to secure 40% marks in overall total for the subject to pass. The scheme is tabulated below.

Sr.	Type of Exam Component	Marks Required to Pass	Total Assigned Marks
1	Internal Marks	12	30
2	Practical Marks	8	20
3	External Written Exam	20	50
4	Total Marks	40	100

5.5.2 In all foundation subjects, student need to secure minimum 40% marks in overall total for the subject to pass.

**R.M.R.S. - 6 Misc. Requirements including Labour Works, Shibirs, Field Work & Dissertation**

**6.1 LABOR WORKS**

There shall be a prior condition to appear in the final examination of first semester that each student has completed the manual labor work of required hours assigned by the work coordinator during each semester. For male student total hours of manual labor work required for each semester will be of 40 hours; for female students, the total hours of manual labor work required for each semester will be of 30 hours. This will be a non credit activity.

**6.2 KHEDUT SHIBIR/ GRAM SHIBIR/ KENDRA NIVAS**

There shall be a work practice camp of one week duration in the second semester each where in the students shall go to villages for "Khedut Shibir/ Gram Shibir/ Kendra Niwas". This will be a non credit activity.

**6.3 Field Work :**

There shall be a work assigned to student in third semester either with an independent agency viz. government, semi-government or non government agency for two weeks. The student has to complete the work satisfactory and

to produce reports pertaining to the work to the college. This will be a credit activity for third semester.

#### 6.4 Dissertation:

There shall be a topic assigned to every student at beginning of fourth semester. The student has to comprehensively study the topic and to produce dissertation related to that. The topic selected should be closely related to major subjected opted by the student. This will be a credit activity for fourth semester.

### **R.M.R.S. - 7 PROMOTION, RE-ADMISSION RULES & MAXIMUM TIME FOR COMPLETION OF COURSE**

7.1 Rules of promotion shall be as under:

7.1.1 From semester I to semester II, if a student undergoes a regular course of study of these semester I and fulfills the required criterion of attendance and secures minimum 12(out of 30) marks in the internal assessment component of each course.

7.1.2 From semester II to semester III, if a student undergoes a regular course of study of these semester II and fulfills the required criterion of attendance and secures minimum 12(out of 30) marks in the internal assessment component of semester II.

7.1.3 From semester III to semester IV, if a student undergoes a regular course of study of these semester III and fulfills the required criterion of attendance and secures minimum 12(out of 30) marks in the internal assessment component of semester III.

7.2 Rules and the Procedure for granting Re-admission to the student shall be as under,

7.2.1 Who had not put in the required attendance in a course in the concern Programme of a semester and thus detained, or

7.2.2 Who had not cleared the required number of Courses and thus detained;  
or

7.2.3 Who had not, after completing a semester continued the studies in the next immediate semester on personal / health grounds but desired to continue his/her studies after a short break; such a student shall be eligible to rejoin the Programme from where he/she had left it, subject to clause 6.1 & 6.2



7.2.4 A student who had put in not less than 40% of attendance in a semester and not registered for the examination shall be considered for the re-admission in the same semester.

7.2.5 The student, who after completing the first two semesters Programme, if opts out of the Programme, then he or she shall be eligible to rejoin the Programme, subject to the time period elapsed has not exceeded two years.

7.2.6 Such readmissions shall be granted by the principal of the concerned college directly, subject to the fulfillment of the following conditions:

- a) The concerned teachers have granted the attendance of the Course in each semester.
- b) The student shall complete the Programme within double the duration of the Programme from the year of the original admission.
- c) No readmission shall be granted after the first four weeks of the Semester in which he/she is seeking admission.

7.2.7 Readmission shall not be applicable to the Programme in which admission is granted by a Central Admission Committee / college itself.

7.2.8 The Four-semester (two year) Programme shall be completed by a student within double the duration of the normal Programme period (i.e. 4 years).

#### **R.M.R.S. - 8 Awards of Grades, SGPA, CGPA Credits, Grade Letter, Grade Points and Credit Points**

8.1 **Credit** means the unit by which the course work is measured. In these Regulations: one credit means one hour of teaching work or one and half hours of practical work per week.

8.2 **Grade Letter** is an index to indicate the performance of a student in a particular course (Paper). It is the transformation of actual marks secured by a student in a course/paper. It is indicated by a Grade letter O, A, B, C, D, E, and F. There is a **range of marks** for each Grade Letter.

8.3 **Grade Point** is weight allotted to each grade letter depending on the marks awarded in a course/paper

**Award of Grades & Class:**

Grade	Degree Class Name	Lower Limit	Upper Limit	Class Description	Grade Letter	Grade Point
O	FIRST CLASS WITH DISTINCTION	90	100	Outstanding	O	10
A	FIRST CLASS WITH DISTINCTION	80	89	Excellent	A	9
B	FIRST CLASS WITH DISTINCTION	70	79	Very Good	B	8
C	FIRST CLASS	60	69	Good	C	7
D	SECOND CLASS	50	59	Below Average	D	6
E	PASS CLASS	40	49	Average	E	5
F	FAIL	0	39	Fail	F	4

**Credit Points for the course** = No. of Credits assigned for the course x Grade Point secured for that course.

**Semester Grade Point Average (SGPA)**

**SGPA** = Total Credit Points in the Semester / Total Credits in the Semester

**Cumulative Grade Point Average (CGPA)**

CGPA refers to the Cumulative Grade Point Average weighted across all the semesters. CGPA is obtained by dividing the total number of credit points in all these semesters by the total number of credits in all the Semesters. The final result at the end of all these semesters is declared in the form of CGPA

**CGPA** = Total Credit Points Obtained From Sem. - 1 to Sem. -4 / Total Credits of Sem. -1 to Sem. -4

**R.M.R.S. - 9****9.1 Rules for selection of Major/Minor/Elective Subject:**

9.1.1 In every semester student has to study 4 core subjects, 2 MDC subjects and 1 foundation subject.

In Semester I and Semester II there shall be no elective subject. All core subjects are to be studied by the student compulsorily.

In Semester III there shall be a major subject group selected by student either from Agronomy, Horticulture, Animal Husbandry & Dairy Science or Rural Extension and a minor subject group be selected from remain three subjects. From major subject group student has to study 2 subjects and from minor subject group student has to study 2 subjects.

In Semester IV student has to study 1 subject from major subject group and 1 subject from minor subject group. Paper 1005 (BLOCK PLACEMENT & FIELD REPORT) and 1006 (DISSERTATION & VIVA) are compulsory core subjects in semester IV.

All MDC subjects and foundation subjects are compulsory in all 4.

9.1.2 The student should be allotted major and minor subject based in subject studied at qualifying degree, though it is not the necessary condition for selection of major and minor subjects.

9.1.3 The major subject shall not be changed throughout course of study. Student cannot change major and minor option once selected.

9.1.4 The student shall / must complete courses offered at Elective / MDC / Foundation as per scheme of syllabus prescribed time to time.

9.1.5 The student has to ensure availability of teachers and the facilities regarding either major, minor, elective or foundation subject with the college/university.

**Notes:**

1. There is 1 foundation subject in all semesters. They are compulsory.
2. There are 2 Multi disciplinary subjects in all semesters. They are compulsory.
3. There will be field work and dissertation component in semester 4. The field work and dissertation components must be allocated in strict accordance of major/core subject. These subjects will be considered core subjects.

## Annexure of Scheme of Study

Sr. No.	Subject Code	Subject Name	Course Type	Credit	Internal Marks		Written / External Marks		Total Marks		Total Marks	Paper Duration
					Theory	Practical	Theory	Practical	Theory	Practical		

### SEMESTER - 1

1	MRS CORE 701	KHARIF CROPS	CORE	3	12 / 30	-	20 / 50	8 / 20	32 / 80	8 / 20	40 / 100	2:00
2	MRS CORE 702	OLERICULTURE / VEGETABLE SCIENCES	CORE	3	12 / 30	-	20 / 50	8 / 20	32 / 80	8 / 20	40 / 100	2:00
3	MRS CORE 703	LIVESTOCK & PAULTRY MANAGEMENT	CORE	3	12 / 30	-	20 / 50	8 / 20	32 / 80	8 / 20	40 / 100	2:00
4	MRS CORE 704	INTRODUCTION TO RURAL EXTENSION	CORE	3	12 / 30	-	20 / 50	8 / 20	32 / 80	8 / 20	40 / 100	2:00
5	MRS MDC 701	AGRO-CHEMICALS, PESTICIDES, FERTILIZERS & MANNURES	MDC ELECTIVE	3	12 / 30	-	20 / 50	8 / 20	32 / 80	8 / 20	40 / 100	2:00
6	MRS MDC 702	INDIAN TRIBAL & RURAL ANTHROPOLOGY	MDC ELECTIVE	3	12 / 30	-	20 / 50	8 / 20	32 / 80	8 / 20	40 / 100	2:00
7	MRS FOU 701	COMPUTER APPLICATIONS	FOUNDATION	0	-	-	-	-	40 / 100	-	40 / 100	No. Uni. Exam

### SEMESTER - 2

1	MRS CORE 801	RABI CROPS	CORE	3	12 / 30	-	20 / 50	8 / 20	32 / 80	8 / 20	40 / 100	2:00
2	MRS CORE 802	POMOLOGY / FRUIT SCIENCES	CORE	3	12 / 30	-	20 / 50	8 / 20	32 / 80	8 / 20	40 / 100	2:00
3	MRS CORE 803	ANIMAL FEED & NUTRITION	CORE	3	12 / 30	-	20 / 50	8 / 20	32 / 80	8 / 20	40 / 100	2:00
4	MRS CORE 804	INTRODUCTION TO EXTENSION	CORE	3	12 / 30	-	20 / 50	8 / 20	32 / 80	8 / 20	40 / 100	2:00
5	MRS MDC 801	IRRIGATION TECHNIQUES	MDC ELECTIVE	3	12 / 30	-	20 / 50	8 / 20	32 / 80	8 / 20	40 / 100	2:00
6	MRS MDC 802	ORGANIC & SUSTANABLE FARMING IN INDIAN CONTEXT	MDC ELECTIVE	3	12 / 30	-	20 / 50	8 / 20	32 / 80	8 / 20	40 / 100	2:00
7	MRS FOU 801	COMMUNICATION SKILLS IN ENGLISH	FOUNDATION	0	-	-	-	-	40 / 100	-	40 / 100	No. Uni. Exam

### SEMESTER - 3

1	MRS CORE 901	INTEGRATED PLANT PROTECTION	CORE	3	12 / 30	-	20 / 50	8 / 20	32 / 80	8 / 20	40 / 100	2:00
2	MRS CORE 902	SOIL SCIENCES	CORE	3	12 / 30	-	20 / 50	8 / 20	32 / 80	8 / 20	40 / 100	2:00
3	MRS CORE 903	FLORICULTURE, LANDSCAPING AND GARDENING	CORE	3	12 / 30	-	20 / 50	8 / 20	32 / 80	8 / 20	40 / 100	2:00
4	MRS CORE 904	AROMATIC, MEDICINAL AND SPICES CROPS	CORE	3	12 / 30	-	20 / 50	8 / 20	32 / 80	8 / 20	40 / 100	2:00
5	MRS CORE 905	INTRODUCTION TO DAIRY FARMING, DAIRY PROCESSES & DAIRY COOPERATIVES	CORE	3	12 / 30	-	20 / 50	8 / 20	32 / 80	8 / 20	40 / 100	2:00

6	MRS CORE 906	INTRODUCTION TO VETERINARY SCIENCE	CO RE	3	12 / 30	-	20 / 50	8 / 20	32 / 80	8 / 20	40 / 100	2:00
7	MRS CORE 907	AGRICULTURAL ECONOMICS & MARKETING	CO RE	3	12 / 30	-	20 / 50	8 / 20	32 / 80	8 / 20	40 / 100	2:00
8	MRS CORE 908	INTRODUCTION TO SOCIAL WORK	CO RE	3	12 / 30	-	20 / 50	8 / 20	32 / 80	8 / 20	40 / 100	2:00
9	MRS MDC 901	RESEARCH METHODOLOGY & SCIENTIFIC / TECHNICAL WRITING	MD C ELE CTI VE	3	12 / 30	-	20 / 50	8 / 20	32 / 80	8 / 20	40 / 100	2:00
10	MRS MDC 902	CONCEPTUAL STUDIES IN SOCIAL SCIENCES	MD C ELE CTI VE	3	12 / 30	-	20 / 50	8 / 20	32 / 80	8 / 20	40 / 100	2:00
11	MRS FOU 901	INTRODUCTION TO HUMAN RIGHTS	FO UN DAT ION	0	-	-	-	-	40 / 100	-	40 / 100	<b>No. Uni. Exam</b>

**SEMESTER - 4**

1	MRS CORE 1001	ADVANCE CONCEPTS IN AGRICULTURE	CO RE	3	12 / 30	-	20 / 50	8 / 20	32 / 80	8 / 20	40 / 100	2:00
2	MRS CORE 1002	ADVANCE CONCEPTS IN HORTICULTURE	CO RE	3	12 / 30	-	20 / 50	8 / 20	32 / 80	8 / 20	40 / 100	2:00
3	MRS CORE 1003	ADVANCE CONCEPTS PRODUCTION AND MANAGEMENT OF ANIMAL, POULTRY & FISHES	CO RE	3	12 / 30	-	20 / 50	8 / 20	32 / 80	8 / 20	40 / 100	2:00
4	MRS CORE 1004	ADVANCE CONCEPTS IN DAIRY & FISHERIES EXTENSION	CO RE	3	12 / 30	-	20 / 50	8 / 20	32 / 80	8 / 20	40 / 100	2:00
5	MRS CORE 1005	BLOCK PLACEMENT & FIELD REPORT	CO RE	3	20 / 50	-	20 / 50	-	40 / 100	-	40 / 100	-
6	MRS CORE 1006	DISSERTATION & VIVA	CO RE	6	40 / 100	-	40 / 100	-	80 / 200	-	80 / 200	-
7	MRS MDC 1001	FARM BUSINESS MANAGEMENT, VALUE ADDITION & ENTREPRENEURSHIP	MD C ELE CTI VE	3	12 / 30	-	20 / 50	8 / 20	32 / 80	8 / 20	40 / 100	2:00
8	MRS MDC 1002	CONSERVATION & MANAGEMENT OF NATURAL RESOURCES	MD C ELE CTI VE	3	12 / 30	-	20 / 50	8 / 20	32 / 80	8 / 20	40 / 100	2:00
9	MRS FOU 1001	RURAL BUSINESS COMMUNICATION	FO UN DAT ION	0	-	-	-	-	40 / 100	-	40 / 100	<b>No. Uni. Exam</b>
		<b>CORE CREDITS</b>			<b>51</b>							
		<b>MDC CREDITS</b>			<b>24</b>							
		<b>FOUNDATION CREDITS</b>			<b>0</b>							
		<b>TOTAL CREDITS</b>			<b>75</b>							

**MRS SEM 1**

Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
1	MRS-CORE-701	CORE	KHARIF CROPS	2 + 1	30 + 20 + 50 = 100

### Theory

**UNIT I** Origin, geographical distribution, economic importance, soil and climatic requirements, varieties, cultural practices, yield and disease & pests of Kharif crops.

**UNIT II** Cereals - rice, maize, sorghum, pearl millet and finger millet

**UNIT III** Pulses-pigeonpea, mungbean and urdbean;

**UNIT IV** Oilseeds- groundnut, and soybean;

**UNIT V** Fibre crops- cotton & jute

**UNIT VI** Forage crops-sorghum, cowpea, cluster bean and napier.

### Practical

1. Identification of seeds and varieties of major kharif crops
2. Seed treatment of different kharif crops
3. Preparation of different methods of rice nursery
4. Study of different land configuration techniques
5. Practice of different methods of sowing of kharif crops
6. Visit/Preparation to crop cafeteria and record growth and yield attributing observations of kharif crops

### Reading

Das NR. 2007. Introduction to Crops of India. Scientific Publ.

Hunsgi G & Krishna KR. 1998. Science of Field Crop Production. Oxford & IBH.

Jeswani LM & Baldev B. 1997. Advances in Pulse Production Technology. ICAR.

Khare D & Bhale MS. 2000. Seed Technology. Scientific Publ.

Kumar Ranjeet & Singh NP. 2003. Maize Production in India: Golden Grain in Transition. IARI, New Delhi.

Pal M, Deka J & Rai RK. 1996. Fundamentals of Cereal Crop Production. Tata McGraw Hill.

Panda, SC. 2006. Crop management and integrated farming. Agrobios (India)

Prasad, Rajendra. 2002. Text Book of Field Crop Production. ICAR.

Singh C, Singh P & Singh R. 2003. Modern Techniques of Raising Field Crops. Oxford & IBH.

Singh, SS. 1998. Crop Management. Kalyani.

Yadav DS. 1992. Pulse Crops. Kalyani.



Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
1	MRS-CORE-702	CORE	OLERICULTURE	2 + 1	30 + 20 + 50 = 100

### Theory

Introduction, botany and taxonomy, climatic and soil requirements, commercial varieties/hybrids, sowing/planting times and methods, seed rate and seed treatment, nutritional and irrigation requirements, intercultural operations, weed control, mulching, physiological disorders, pests & diseases, harvesting, post-harvest management, plant protection measures and seed production of:

**UNIT I** Potato

**UNIT II** Cole crops: cabbage, cauliflower, sprouting broccoli, Brussels sprout

**UNIT III** Root crops: carrot, radish, turnip and beetroot

**UNIT IV** Bulb crops: onion and garlic

**UNIT V** Peas and broad bean, green leafy cool & warm season vegetables

**UNIT VI** Tomato, eggplant, Chilli

**UNIT VII** Okra, beans and cowpea

**UNIT VIII** Cucurbitaceous crops

**UNIT IX** Tapioca and sweet potato, elephant foot yam

### Practical

Cultural operations (fertilizer application, sowing, mulching, irrigation, weed control) of vegetable crops and their economics; study of physiological disorders and deficiency of mineral elements, preparation of cropping schemes for commercial farms; plant growth substances and herbicides; seed extraction techniques; identification of important pests and diseases and their control; maturity standards; economics of warm & cool season vegetable crops.

### Suggested Readings

Bose TK & Som MG. (Eds.). 1986. Vegetable Crops in India. Naya Prokash.

Bose TK, Kabir J, Maity TK, Parthasarathy VA & Som MG. 2003. Vegetable Crops. Vols. I-III. Naya Udyog.

Brown HD & Hutchison CS. Vegetable Science. JB Lippincott Co.

Chadha KL. (Ed.). 2002. Hand Book of Horticulture. ICAR.

Thamburaj S & Singh N. 2004. Vegetables, Tuber Crops and Spices. ICAR.  
A Textbook of Olericulture, Sheikh Ayyub  
Olericulture in india, Rana  
Olericulture Vol I & Vol II, K P Singh

Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
1	MRS-CORE-703	CORE	LIVESTOCK & PAULTRY MANAGEMENT	2 + 1	30 + 20 + 50 = 100

### Theory

**UNIT I** Role of livestock in the national economy.

**UNIT II** Identification of breeds and it's importance & their characteristics.

Important Indian and exotic breeds of cattle, buffalo, sheep, goat, swine and poultry.

**UNIT III** Reproduction in farm animals and poultry.

**UNIT IV** Housing principles, space requirements for different species of livestock and poultry. Management of calves, growing heifers and milch animals.

**UNIT V** Management of sheep, goat and swine.

**UNIT VI** Incubation, hatching and brooding.

**UNIT VII** Management of growers and layers.

**UNIT VIII** Improvement of farm animals and poultry.

**UNIT IX** Digestion in livestock and poultry. Classification of feedstuffs.

Proximate principles of feed. Nutrients and their functions. Feed ingredients for ration for livestock and poultry. Feed supplements and feed additives. Feeding of livestock and poultry.

**UNIT X** Introduction of livestock and poultry diseases. Prevention (including vaccination schedule) and control of important diseases of livestock and poultry.

### Practical

1. Study of body parts and points of cattle, sheep, goat and poultry and their significance.
2. Measuring and weighing of farm animals.
3. Use of common restraints used in different animals
4. System of identification of livestock production
5. Determination of age in farm animals
6. Identification of common feeds and fodders

7. Importance of eggs in human nutrition.

**Reference Books:**

- (1) "PashuVyavastha" (Gujarati) - A.D. Dave & Lakshman Patel
- (2) "ViyavaharuGopalan" (Gujarati) - Krushnalal Shukal
- (3) "PashuSanvardhan" (Gujarati) - R.K. Shukla
- (4) Animal Gynaecology and Veterinary Obstetrics -Part 1/2/3 - S.B. Kodagali & B.K. Bhavsar
- (5) A Text book of Animal Husbandry - G.C. Banerjee
- (6) A Hand Book of Animal Husbandry - ICAR

Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
1	MRS-CORE-704	CORE	INTRODUCTION TO RURAL EXTENSION	2 + 1	30 + 20 + 50 = 100

**શીયરી:**

૧. ભારતમાં ગ્રામ વિકાસનો ઇતિહાસ, વિવિધ ગ્રામ વિકાસ સંસ્થાઓ, વિવિધ ગ્રામ વિકાસ યોજનાઓ
૨. ગ્રામ વિકાસમાં સ્વૈચ્છિક સંસ્થાઓ, સહકારી સંસ્થાઓ, સરકારી સંસ્થાઓ, બેંકો વગેરેનો ફાળો
૩. વૈધિક તથા અવૈધિક શિક્ષણ, અર્થ ખ્યાલો અને જરૂરીયાતો
૪. વિસ્તરણ શિક્ષણનું મહત્વ, તેનું કાર્યક્ષેત્ર, અગત્યની પદ્ધતિઓ અને તેની અસરો
૫. વિસ્તરણના ઉદ્દેશો અને ગ્રામવિકાસમાં તેનું મહત્વ
૬. વિસ્તરણમાં કાર્યકર્તાની જરૂરીયાત, મહત્વ તથા સમગ્ર વિભાવના
૭. વિસ્તરણ કાર્યકર્તાનું કાર્યક્ષેત્ર, કાર્યો અને ભૂમિકાઓ
૮. વિસ્તરણ કાર્યકર્તા માટેની તાલીમ તથા તેનું મહત્વ અને જરૂરીયાત

**પ્રાયોગીક:**

૧. સ્વૈચ્છીક/સહકારી સંસ્થાઓની મુલાકાત તથા તેની કાર્યપદ્ધતિની તપાસણી
૨. વૈધિક શિક્ષણનું પ્રત્યક્ષીકરણ
૩. અવૈધિક શિક્ષણનું પ્રત્યક્ષીકરણ
૪. વિવિધ સંચાર માધ્યમોનું વિનિયોજન
૫. વિવિધ ગ્રામ વિકાસ યોજનાઓની કેસ સ્ટડી

**સંદર્ભ :**

૧. ભારતની સામાજીક સંસ્થાઓ, શાહ અને જોષી
૨. ભારતમાં ગ્રામ વિકાસ, બાબુભાઈ અવરાણી
૩. કૃષિ વિસ્તરણ શિક્ષણ, બાબુભાઈ અવરાણી
૪. વિસ્તરણના મૂળ તત્ત્વો, ધીરજ ધકાણ
૫. સામુદાયીક વિકાસ અને કૃષિ વિસ્તરણ, બાબુભાઈ અવરાણી

Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
1	MRS-MDC-701	MULTI DISCIPLINARY	AGRO-CHEMICALS, PESTICIDES, FERTILIZERS & MANNURES	2 + 1	30 + 20 + 50 = 100

### Theory

**UNIT I** :Introduction to Organic & Inorganic Chemistry, Atoms Molecules, Bonds and basic concepts of Chemistry.

Agro-chemicals: Definition and classification; Basic knowledge of agrochemicals; role and status of agro-chemical industry in India; Pesticides - Classification and Introduction, knowledge of different pesticides. Biopesticides Types and detailed studies of : Insecticides and their subtypes, Fungicides & Pesticides.

Introductory knowledge about development of agro-chemicals; Insecticidal poisoning, symptoms and treatment; Main features of Insecticide Act.

**UNIT II** :Soil fertility and productivity - factors affecting; features of good soil management; problems of supply and availability of nutrients; relation between nutrient supply and crop growth; organic farming - basic concepts and definitions.

Criteria of essentiality of nutrients; Essential plant nutrients - their functions, nutrient deficiency symptoms

**UNIT III** :Detailed study of various types of fertilizers (viz. composition, relative fertilizer value and cost; crop response to different nutrients, residual effects and fertilizer use efficiency, fertilizer mixtures and grades)- chemical based (Nitrate, Phosphatic, Potash), Biofertilizers

Detailed study of farmyard manure, compost, green manures, vermicompost, and other organic concentrates their composition, availability and crop responses; recycling of organic wastes and residue management.

### Practical

Types and methods of manures and fertilizers application; foliar application and its concept; relative performance of organic and inorganic manures; economics of fertilizer use; integrated nutrient management; use of vermicompost and residue wastes in crops

Determination of soil pH, ECe, organic C, total N, available N, P, K and S in soils

Determination of N, P, K and S content in soil.

Interpretation of interaction effects and computation of economic and yield optima.

Various applications of fertilizers and manures

### **Suggested Readings**

Brady NC & Weil R.R 2002. The Nature and Properties of Soils. . Pearson Edu.

Havlin JL, Beaton JD, Tisdale SL & Nelson WL. 2006. Soil Fertility and Fertilizers. 7th Ed. Prentice Hall.

Yawalkar KS, Agrawal JP & Bokde S. 2000. Manures and Fertilizers. Agri-Horti Publ.

Principles and procedures of plant protection (Third edition) S.B.Chattopadhyay  
Sampurna Paksarakshan (Part-1) Babubhai Avarani

Sampurna Paksarakshan (Part-2) Babubhai Avarani

Dhaliwal GS, Singh R & Chhillar BS. 2006. Essentials of Agricultural Entomology. Kalyani.

Manual on Manures, Fertilizers and Agro-Chemicals, Mailappa, BRILLION, 2020

Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
1	MRS-MDC-702	MULTI DISCIPLINARY	INDIAN TRIBAL & RURAL ANTHROPOLOGY	2 + 1	30 + 20 + 50 = 100

### Theory

**UNIT I :**Meaning, scope and development of Anthropology. Relationships with other disciplines.Main branches of Anthropology, their scope and relevance. Human Evolution and emergence of Man. Phylogenetic status, characteristics and geographical distribution.

**UNIT II:**Culture, Society, Marriage, Family, Kinship, Economic and Political Organization, Social Control, Religion, Anthropological theories, Language and Communication, Research Methods in Anthropology. Race and Racism. Applications of Anthropology. Ethno-archaeology in India. Demographic profile of India.

**UNIT III:**Rural sociology- Meaning, scope and significance. Structural differentiation in terms of difference and characteristics of rural and urban societies. Planned social change - Approaches to rural planning, improvement and transformation and their shortcomings. Indian rural institutions: The structure and nature of traditional Indian social system. Caste system in India

**UNIT IV:**Definition and characteristics of a tribe. Tribes and aborigines- an anthropological perspective. Racial classification and distribution of tribes. Tribes in India and Gujarat. Tribal economy. Tribals and Constitution of India, Administration of tribal areas in independent India- appraisal of tribal development - problems of tribal identity and integration in the mainstream. Relation between tribes and forests- forest as their immediate environment. Forests as the means of livelihood.

### Study Tour / Practical

Study tour of one week duration in the respective States/part of India. To familiarize the students with the fauna, flora and other research activities of



various social and tribal institutes, Research institute, forest industries, Govt. and private organizations of different parts of respective states/ part of India. To expose the students to various national / heritage monuments as part of national integration activity.

### **Suggested Readings**

Chitambar, J.B. (1973). Introductory rural sociology. New York, John Wiley and Sons.

Desai, A.R. (1978). Rural sociology in India. Bombay, Popular Prakashan, 5th Rev. ed.

Doshi, S.L. (2007). Rural sociology. Delhi Rawat Publishers.

Jayapalan, N. (2002). Rural sociology. New Delhi, Altanic Publishers.

Sharma, K.L. (1997). Rural society in India. Delhi, Rawat Publishers.

Haimendorf, C.V. 1985. Tribes of India - the struggle for survival. OUP. New Delhi

Hasnain, N. 2007. Tribal India. New Royal Book Company

Hasnain, N. 2011. Indian Anthropology. PalakaPrakashan

Sharma, R.N. and Bakshi, S. 1984. Tribes and tribal development. Uppal Publ. House, New Delhi

Sharma, R. N., Sharma, R.K. 1997. Anthropology. Atlantic Publishers & Distributors.

Thakur, D. 1986. Socio-economic development of tribes in India. Deep and Deep Publications, New Delhi

<b>Semester</b>	<b>Paper Code</b>	<b>Paper Type</b>	<b>Subject Name</b>	<b>Credit</b>	<b>Marks Scheme</b>
1	MRS-FOU-701	FOUNDATION	COMPUTER APPLICATIONS	0	100

### **Theory**

**Unit 1** :Introduction to Computers, Anatomy of Computers, Input and Output Devices. Units of Memory, Hardware, Software and Classification of Computers. Personal Computers, Types of Processors

**Unit 2** :Computer Viruses, Worms and Remedies including Antivirus

**Unit 3** :Operating System - DOS and WINDOWS.

Disk Operating System (DOS): Some fundamental DOS Commands, FORMAT, DIR, COPY, PATH, LABEL, VOL, MD, CD and DELTREE, Rules for naming files in DOS and Types of files.

WINDOWS: GUI, Desktop and its elements, WINDOWS Explorer, working with files and folders; setting time and date, starting and shutting down of WINDOWS. Anatomy of a WINDOW, Title Bar, Minimum, Maximum and Close Buttons, Scroll Bars, Menus and Tool Bars.

**Unit 4** :MSWORD: Word, processing and units of document, features of word-processing packages. Creating, Editing, Formatting and Saving a document in MSWORD;

**Unit 5** :MSEXCEL: Electronic Spreadsheets, concept, packages. Creating, Editing and Saving a spreadsheet with MSEXCEL. Use of in-built Statistical and other functions and writing expressions. Use of Data Analysis Tools, Correlation and Regression, t-test for two-samples and ANOVA with One-way Classification. Creating Graphs.

**Unit 6** :MS Power Point: Features of Power Point Package.

**Unit 7**: MSACCESS: Concept of Database, Units of database, creating database; Principles of **Unit 8** :Programming: Flow Charts and Algorithms, illustration through examples.

**Unit 9** :Internet: World Wide Web (WWW), Concepts, Web Browsing and Electronic Mail.

### **Practical**

Study of Computer Components; Booting of Computer and its Shut Down; Practice of some fundamental DOS Commands, TIME, DATE, DIR, COPY, FORMAT, VOL, LABEL, PATH; Practicing

WINDOWS Operating System, Use of Mouse, Title Bar, Minimum, Maximum and Close Buttons, Scroll Bars, Menus and Tool Bars;

WINDOWS Explorer, Creating Folders, COPY and PASTE functions;

MSWORD: Creating a Document, Saving and Editing; MSWORD, Use of options from Tool Bars, Format, Insert and Tools (Spelling & Grammar) Alignment of text; MSWORD, Creating a Table, Merging of Cells, Column and Row width;

MSEXCEL: Creating a Spreadsheet, Alignment of rows, columns and cells using Format tool bar; MSEXCEL: Entering Expressions through the formula tool bar and use of inbuilt functions, SUM, AVERAGE, STDEV; MSEXCEL: Data Analysis using inbuilt Tool Packs, Correlation & Regression; MSEXCEL: Creating Graphs and Saving with & without data;

MSACCESS: Creating Database, Structuring with different types of fields;

MS Power Point: Preparation of slides on Power Point;

Transforming the data of WORD, EXCEL and ACCESS to other formats;

Internet Browsing: Browsing a Web Page and Creating of E-Mail ID.

**References**

Computer Fundamentals : Concepts, Systems & Applications- 8th Edition by Priti Sinha, Pradeep K., Sinha | 30 November 2004

BPB Publications Computer Fundamentals Sixth Edition Complete Book By Pradeep K Sinha

Windows 7 / Windows 10 In Easy Steps

BPB's Computer Course Windows 10 with MS Office 2016. Satish Jain

CCC Book , Dr. BAOU Student Learning Module

**MRS SEM 2**

Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
2	MRS-CORE-801	CORE	RABI CROPS	2 + 1	30 + 20 + 50 = 100

### Theory

**Unit I** :Origin, geographical distribution, economic importance, soil and climatic requirements, varieties, cultural practices, yield, pests & diseases of Rabi crops.

**Unit II** :Rabi cereals: Wheat

**Unit III** :Rabi pulses: Chickpea, Pea and Indian bean

**Unit IV** :Rabi oilseeds - Rapeseed and mustard, linseed, niger and sunflower

**Unit V**: Fiber crops - Cotton and Sunhemp

**Unit VI** :Sugar crops - Sugar-beet and sugarcane.

### Practical

1. Identification of seeds and varieties of major rabi crops
2. Seed treatment of different rabi crops
3. Study of different land configuration techniques
4. Practice of different methods of sowing of rabi crops
6. Visit/Preparation to crop cafeteria and record growth and yield attributing observations of rabi crops

### Reading

Das NR. 2007. Introduction to Crops of India. Scientific Publ.

Hunsgi G & Krishna KR. 1998. Science of Field Crop Production. Oxford & IBH.

Jeswani LM & Baldev B. 1997. Advances in Pulse Production Technology. ICAR.

Khare D & Bhale MS. 2000. Seed Technology. Scientific Publ.

Kumar Ranjeet & Singh NP. 2003. Maize Production in India: Golden Grain in Transition. IARI, New Delhi.

Pal M, Deka J & Rai RK. 1996. Fundamentals of Cereal Crop Production. Tata McGraw Hill.

Panda, SC. 2006. Crop management and integrated farming. Agrobios (India)

Prasad, Rajendra. 2002. Text Book of Field Crop Production. ICAR.

Singh C, Singh P & Singh R. 2003. Modern Techniques of Raising Field Crops. Oxford & IBH.

Singh, SS. 1998. Crop Management. Kalyani.

Yadav DS. 1992. Pulse Crops. Kalyani.

Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
2	MRS-CORE-802	CORE	POMOLOGY	2 + 1	30 + 20 + 50 = 100

### Theory

Commercial varieties of regional, national and international importance, eco-physiological requirements, recent trends in propagation, rootstock influence, planting systems, cropping systems, root zone and canopy management, nutrient management, water management, fertigation, role of bioregulators, abiotic factors limiting fruit production, physiology of flowering, pollination fruit set and development, physiological disorders- causes and remedies, quality improvement by management practices; maturity indices, harvesting, grading, packing, storage and ripening techniques; industrial and export potential, Agri. Export Zones(AEZ) and industrial supports of

**UNIT I** :Mango, banana and pineapple

**UNIT II**: Citrus, grapes, guava and sapota

**UNIT III**: Jackfruit, papaya, custard apple, aonla, avocado and ber

**UNIT IV**: Mangosteen, litchi, jamun, phalsa, mulberry, raspberry, kokam and nuts

**UNIT V**: Carambola, bael, wood apple, fig, jamun, pomegranate

### Practical

Identification of important cultivars, observations on growth and development, practices in growth regulation, analyses of quality attributes, visit to tropical and arid zone orchards, Project preparation for establishing commercial orchards.

### Suggested Readings

Bose TK, Mitra SK & Rathore DS. (Eds.). 1988. Temperate Fruits - Horticulture. Allied Publ.

Bose TK, Mitra SK & Sanyal D. 2001. (Eds.). Fruits -Tropical and Subtropical. Naya Udyog.

Chadha KL & Pareek OP. 1996. (Eds.). Advances in Horticulture. Vols. IIIV. Malhotra Publ. House.

Nakasone HY & Paul RE. 1998. Tropical Fruits. CAB I.

Peter KV. 2008. (Ed.). Basics of Horticulture. New India Publ. Agency.

Pradeepkumar T, Suma B, Jyothibhaskar&Satheesan KN. 2008.

Management of Horticultural Crops. Parts I, II. New India Publ. Agency.

Radha T & Mathew L. 2007. Fruit Crops. New India Publ. Agency.

Singh HP, Negi JP & Samuel JC. (Eds.). 2002. Approaches for Sustainable Development of Horticulture. National Horticultural Board.

Singh HP, Singh G, Samuel JC & Pathak RK. (Eds.). 2003. Precision Farming in Horticulture. NCPAH, DAC/PFDC, CISH, Lucknow.



Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
2	MRS-CORE-803	CORE	ANIMAL FEED & NUTRITION	2 + 1	30 + 20 + 50 = 100

### Theory

**Unit : 1** History of Animal Nutrition, Terminology of Animal Nutrition Composition and classification of feed stuffs :- Roughages : Dry and Succulent. General nutrition, proximate principles

**Unit : 2** Study of ingredients of cattle feeds and water: importance and functions. Carbohydrates and proteins: importance and classification. Nutrients of feeding stuffs and animal body : water, carbohydrates, protein, Lipids and minerals. Types of Concentrates: energy rich and protein rich. Concentrates: Energy rich and protein rich :- Energy rich concentrates, Protein rich concentrates: Plant, Animal & NPN feed stuffs.

Balanced ration: Importance and advantages.

**Unit : 3** Lipids, Minerals and Vitamins: importance and types, Feeding requirements for different classes of animals: Milking cow, pregnant cow, dry cow, Breeding bull and bullocks. Feeds supplements and bypass proteins, And Bypass fat.

**Unit : 4** Unconventional Livestock feeds in India

- Vegetable protein sources.
- Animal protein sources.
- Energy sources.
- Miscellaneous feeds.
- Feed supplements and bypass proteins.
- Poultry Food

**Unit : 5** Qualities of ideal rationing and principles of rationing for animals, Computation of rotation "Methods and calculation of daily requirement of feeds and concentrates for animals -DCP, TDN & NE.

Processing of inferior quality roughages: Grinding, Chafing, Soaking in water, alkali treatment and urea treatment, Detail of urea treatment, Nontraditional cattle feed and feed uses during draught.

Harmful Substances in animal feeds and their preventive measures,  
Unconventional Livestock feeds in India - Vegetable protein sources. - Animal  
protein sources. - Energy sources.

### Practical

Preparation of cattle/animal food

Nutrient Assessment

Computation of Balanced Ratio

Identification of various substances in cattle/animal food

Nutrition Assessment & Fortification of cattle/animal food

### References :-

1. પશુ આહાર, બી એમ પટેલ
2. પશુ આહાર, (પ્રાયોગીક) બી એમ પટેલ
3. Animal Nutrition - Maynard & Loosli
4. Animal Nutrition - A. C. Chaudhari
- 5 "PashuVyavastha" (Gujarati) - A.D. Dave & Lakshman Patel
- 6 "ViyavaharuGopalan" (Gujarati) -KrushnalalShukal
- 7 "PashuSanvardhan" (Gujarati) - R.K. Shukla
- 8 A Text book of Animal Husbandry - G.C. Banerjee
- 9 A Hand Book of Animal Husbandry - ICAR

Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
2	MRS-CORE-804	CORE	INTRODUCTION TO EXTENSION EDUCATION	2 + 1	30 + 20 + 50 = 100

### થીયરી:

૧. માનવ જરૂરીયાત, વ્યાખ્યા, ખાસીયતો અને વર્ગીકરણ, માનવ રસ અને તેને અસરકર્તા પરિબલો અને ખાસીયતો
૨. અભિપ્રેરણા, વ્યાખ્યા અને તેના પ્રકારો અને રીતો
૩. ભણાવવું વ્યાખ્યા, પદ્ધતિઓ અને તેના પગથિયા,
૪. ભણવું વ્યાખ્યા, પ્રક્રિયા, પદ્ધતિઓ, સિધ્ધાંતો, વિષય વસ્તુ, ભૌતિક સુવિધાઓ, સાધન સામગ્રી
૫. વિસ્તરણ શિક્ષણનો પરિચય, મહત્વ, તેનું કાર્યક્ષેત્ર, અગત્યની પદ્ધતિઓ અને તેની અસરો અને સમગ્ર વિભાવના વિસ્તરણમાં કાર્યકર્તાની જરૂરીયાત, મહત્વ તથા સમગ્ર વિભાવના
૬. વિસ્તરણના ઉદ્દેશો અને ગ્રામવિકાસમાં તેનું મહત્વ, વિસ્તરણ વિકાસમાં દુનીયાના દેશોનો ફાળો તેમજ દુનીયાના વિકાસમાં વિસ્તરણનો ફાળો
૭. વિસ્તરણને લગતા (ખાસ કરીને કૃષી વિસ્તરણ) ઉપયોગી સિધ્ધાંતો અને અપેક્ષાઓ
૮. વિસ્તરણને કાર્યમાં વ્યક્તિ, જુથ અને સમૂહ સંપર્ક પદ્ધતિઓનો ઉપયોગ તથા રીતો

### પ્રાયોગીક:

પ્રાયોગિક : વર્ગખંડ શિક્ષણના પ્રયોગ, શિક્ષણ માટે ઉપયોગી ઉપકરણોની ઓળખ તથા ઉપયોગ  
અભિપ્રેરણા તથા ભણાવવાની રીતોના પ્રયોગો  
ખેડૂતોની પ્રત્યક્ષ મુલાકાત  
ગ્રામજનોની પ્રત્યક્ષ મુલાકાત  
ખેડૂતોની સાંપ્રત સમસ્યાઓનો અભ્યાસ  
મહિલા ખેડૂતોનો અભ્યાસ  
આદિવાસી ખેડૂતોનો અભ્યાસ

**સંદર્ભ:**

૧. કૃષિ વિસ્તરણ શિક્ષણ, ઈશ્વરભાઈ પટેલ
૨. ભારતમાં ગ્રામ વિકાસ, બાબુભાઈ અવરાણી
૩. કૃષિ વિસ્તરણ શિક્ષણ, બાબુભાઈ અવરાણી
૪. વિસ્તરણના શિક્ષણના સિદ્ધાંતો, ધીરજ ધકાણ
૫. સામુદાયીક વિકાસ અને કૃષિ વિસ્તરણ, બાબુભાઈ અવરાણી
૬. કૃષિ વિસ્તરણ શિક્ષણ, બાબુભાઈ અવરાણી

Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
2	MRS-MDC-801	MULTI DISCIPLINARY	IRRIGATION TECHNIQUES	2 + 1	30 + 20 + 50 = 100

### Theory

**UNIT I:**Water management: Principles of irrigation Water and irrigation requirements, Concepts and approaches of irrigation scheduling, Water and its role in plants; Methods of irrigation, Measurement of irrigation water, application, distribution and use efficiencies, Conjunctive use of water, Improving water use efficiency of crops.

**UNIT II:**Soil water movement in soil and plants; transpiration; soil-water-plant relationships; water absorption by plants; plant response to water stress, crop plant adaptation to moisture stress condition.

Surface and groundnut resources, rainfall, rainfall-runoff relations, measurement and estimation of runoff, irrigation development in India, command area development, watershed management principles, government schemes in watershed management program, water harvesting structures including farm ponds, water quality including physical, chemical and biological properties.

**UNIT III:**Soil, plant and meteorological factors determining water needs of crops; scheduling, depth and methods of irrigation; microirrigation system; fertigation; management of water in controlled environments and polyhouses.

**UNIT IV:**Water management of the crops and cropping systems; quality of irrigation water and management of saline water for irrigation; water use efficiency. Irrigation water quality and its management, water management in major field, crops (rice, wheat, maize, groundnut, sugarcane) Agricultural drainage.

**UNIT V:**Excess of soil water and plant growth; water management in problem soils; drainage requirement of crops and methods of field drainage, their layout and spacing.

**UNIT VI:**Water resources of India, major irrigation projects, extent of area and crops irrigated in India and different states institution of water management in commands, farmer's participation in command areas; irrigation legislation.

### Practical

- Measurement of soil water potential by using tensiometer, and pressure plate and membrane apparatus
- Water flow measurements using different devices
- Determination of irrigation requirements
- Calculation of irrigation efficiency
- Determination of infiltration rate
- Determination of saturated/unsaturated hydraulic conductivity
- Determination of water infiltration characteristics and water holding capacity of soil profiles
- Moisture extraction pattern of crops
- Consumptive use, water requirement of a given cropping pattern for optimum/variable productivity
- Crop planning at the farm and project level
- Visit of Irrigation Project

#### Suggested Readings

Lenka D. 1999. Irrigation and Drainage. Kalyani

Michael AM. 1978. Irrigation: Theory and Practice. Vikas Publ.

Paliwal KV. 1972. Irrigation with Saline Water. IARI Monograph, New Delhi.

Prihar SS & Sandhu BS. 1987. Irrigation of Food Crops - Principles and Practices. ICAR.

Misra RD and Ahmed, M. 1990 A Practical Manual on irrigation. Oxford & IBH Publishing co. Pvt. Ltd., New delhi.

Reddy SR. 2000. Principles of Crop Production. Kalyani.

Reddi GHS and Reddy TY 2002. Efficient use of irrigation water. Kalyani.

Panda SC. 2003. Principles and Practices of Water Management. Agrobios.

Sankara Reddy GH & Yellamananda Reddy 1995. Efficient Use of Irrigation Water. In: Gupta US. (Ed.). Production and Improvement of Crops for Drylands. Oxford & IBH.

Singh SS. 2006. Principles and Practices of Agronomy. In: Gupta US. (Ed.). Production and Improvement of Crops for Drylands. Oxford & IBH.

Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
2	MRS-MDC-802	MULTI DISCIPLINARY	ORGANIC & SUSTANABLE FARMING IN INDIAN CONTEXT	2 + 1	30 + 20 + 50 = 100

### Theory

**UNIT I** :Organic farming - concept and definition, its relevance to India and global agriculture and future prospects; Organic production requirements; land and water management - land use, minimum tillage; shelter zones, hedges, pasture management, agro-forestry.

**UNIT II** :Organic farming and water use efficiency; Soil improvement and amendements; soil fertility, nutrient recycling, organic residues, organic manures, composting, soil biota and decomposition of organic residues, earthworms and vermicompost, green manures, biofertilizers, biodynamic and integrated bio nutrient management.

**UNIT III** :Farming systems, crop rotations, multiple and relay cropping systems, intercropping in relation to maintenance of soil productivity.

**UNIT IV** :Control of weeds, diseases and insect pest management, biological agents and pheromones, biopesticides, trap crops, bird perches;

**UNIT V** :Socio-economic impacts; marketing and export potential: inspection, certification, labeling and accreditation procedures.

**UNIT VI** :SUSTANABLE FARMING: Introduction, Definition, goal and concepts, Status of Sustainable farming in India, National Mission for Sustainable Agriculture, Some Important Concepts in Sustainable: Farming Permaculture, Agro Forestry, Mixed farming, Aquaponics & Hydroponics, Using Renewable Energy Resources, Crop Rotation & Polycultures etc, Soil Conservation.

**UNIT VII**:Indian Farming System: Opportunities & Challenges, Jivamrut types, compositions and usagem, Plant Protection in Indian Farming System, Cow Based Farming, Vedic Krishi

**UNIT VIII**:Introduction of Indian agricultural heritage; Ancient agricultural practices, Relevance of heritage to present day agriculture; Past and present status of agriculture and farmers in society; Journey of Indian agriculture and

its development from past to modern era; Plant production and protection through indigenous traditional knowledge; Crop voyage in India and world; Agriculture scope; Importance of agriculture and agricultural resources available in India; Cropsignificance and classifications; National agriculture setup in India; Current scenario of Indianagriculture; Indian agricultural concerns and future prospects.

### **Practical**

1. Study of different organic materials
2. Preparation of enriched Farm Yard Manure
3. Study of composting methods
4. Preparation of vermicompost
5. Study of recycling of farm waste
6. Study of green manuring
7. Raising of vegetable crops organically through nutrient, diseases and pest Management
8. Quality analysis, grading packaging, postharvest management.
9. Visit to an organic farm/Visit to Hydroponic, Aquaponic Installations

### **Suggested Readings**

Lampin N. 1990. Organic Farming. Press Books, Ipswich, UK.

Palaniappan SP & Anandurai K. 1999. Organic Farming - Theory and Practice. Scientific Publ.

Rao BV Venkata. 1995. Small Farmer Focused Integrated Rural Development: Socio-economic Environment and Legal Perspective: Publ.3, Parisaraprajna Parishtana, Bangalore.

Reddy MV. (Ed.). 1995. Soil Organisms and Litter Decomposition in the Tropics. Oxford & IBH.

Sharma A. 2002. Hand Book of Organic Farming. Agrobios.

Singh SP. (Ed.) 1994. Technology for Production of Natural Enemies. PDBC, Bangalore.

Subba Rao NS. 2002. Soil Microbiology. Oxford & IBH.

Veeresh GK, Shivashankar K & Suiglachar MA. 1997. Organic Farming and Sustainable Agriculture. Association for Promotion of Organic Farming, Bangalore.

Prakrutik Kheti, Acharya Devvrat



Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
2	MRS-FOU-801	FOUNDATION	COMMUNICATION SKILLS IN ENGLISH	0	100

**Unit 1 Text:**

I too had a dream, VergheseKurien

Short & Descriptive Question Answer (Excerpts of the book: Life of VergheseKurien, History of Amul, Operation Flood, Social implications of Amul & Co-operative movement)

**Unit 2: Business Correspondence -**

Business Letters, Structure of letter, - Some sample business letters including Inquires, Invoices/Bills, Quotations, Orders, Complaints, Account Statements, Leave, Payment/receipt etc.

Business Forms - Structure of forms, Bank related forms, Insurance related forms, Educational Admission forms, Job Application forms etc.

**Unit 3: Functional English**

Introduction of self and others, Roles & Responsibilities, Meetings, Setting agendas, Writing Minutes, Taking Notes, Making Presentation, Responding to Queries

Verbal Communication using Telephone

Verbal Communication with native and non native speaker

Reporting: Written Reports, Summarizing Reports, Orally Presenting Reports

**Unit 4:** Basic Grammar including part of speech, articles, tenses, verbs, adverbs, adjectives, punctuation marks, prepositions, Active/Passive voice, Direct/Indirect speech

**Unit 5:** Composition & Translation, Essays & Paragraph Writing

### Practical:

1. Self-Introduction, Introducing Others, Making Small talks
2. Group Discussion
3. Making Business Inquiries (Written/Verbal)
4. Presentation on domain specific topic
5. Reporting on domain specific topic

### Readings

Text: I too had a dream, Verghese Kurien

High School English Grammar, Wren & Martin

**MRS SEM 3**

Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
3	MRS-CORE-901	CORE	INTEGRATED CROP & PLANT PROTECTION	2 + 1	30 + 20 + 50 = 100

### Theory

**Unit I:** Introduction to the science of phytopathology, its objectives, scope and historical background.

**Unit II:** Insect Ecology: Introduction, Environment and its components.

Introduction to Insects: Structure of insects, Life cycle of insect-metamorphosis, Important characteristics of insects for their survival on earth, Classification of insects on the basis of wing, feeding habits and importance. Effect of abiotic factors: temperature, moisture, humidity, rainfall, light, atmospheric pressure and air currents. Effect of biotic factors - food competition, natural and environmental resistance. Concepts of Balance of life in nature, biotic potential and environmental resistance and causes for outbreak of pests in agro-ecosystem. Pest surveillance and pest forecasting. Categories of pests.

Beneficial insects: parasites and predators used in pest control and their mass multiplication techniques. Important groups of microorganisms, bacteria, viruses and fungi used in pest control and their mass multiplication techniques. Important species of pollinators, weed killers and scavengers, their importance.

**Unit III:** Classification of plant diseases, symptoms, signs, and related terminology. Parasitic causes of plant diseases (fungi, bacteria, viruses, phytoplasma, protozoa, algae and flowering parasitic plants), their characteristics and classification. Non-parasitic causes of plant diseases. Infection process. Survival and dispersal of plant pathogens. Plant disease epidemiology, forecasting and disease assessment. Principles and methods of plant disease management. Integrated plant disease management.

**Unit IV:** Fungicides classification based on chemical nature, Commonly used fungicides, bactericides and nematicides. Study of important insecticides. Botanical insecticides - neem based products, Cyclodiens, Organophosphates, Carbamates, Synthetic pyrethroids, Novel insecticides, Pheromones, Nicotiny insecticides, Chitin synthesis inhibitors, Phenyl pyrazoles, Avermectins, Macrocyclic lactones, Oxadiazimes, Thiourea derivatives, pyridine azomethines, pyrroles, etc. Nematicides, Rodenticides, Acaricides and fumigants. Recent methods of pest control,

repellents, antifeedants, hormones, attractants, gamma radiation and genetic control. Practices, scope and limitations of IPM. Insecticides Act 1968 - Important provisions. Application techniques of spray fluids. Phytotoxicity of insecticides. Symptoms of poisoning, first aid and antidotes.

**Unit V:** Categories of insect pests and diseases, IPM: Introduction, history, importance, concepts, principles and tools of IPM. Economic importance of insect pests, diseases and pest risk analysis.

Methods of detection and diagnosis of insect pest and diseases. Calculation and dynamics of economic injury level and importance of Economic threshold level. Methods of control: Host plant resistance, cultural, mechanical, physical, legislative, biological and chemical control. Ecological management of crop environment. Introduction to conventional pesticides for the insect pests and disease management. Survey surveillance and forecasting of Insect pest and diseases. Development and validation of IPM module. Implementation and impact of IPM (IPM module for Insect pest and disease. Safety issues in pesticide uses. Political, social and legal implication of IPM. Case histories of important IPM programmes. Case histories of important IPM programmes.

**Unit VI:** Stored grain pests: Coleopteran and Lepidopteran pests, their biology and damage, preventive and curative methods. Distribution, biology, nature and symptoms of damage, and management strategies of insect and non insect pests of rice, sorghum, maize, ragi (*Eleusine coracana*), wheat, sugarcane, cotton, sunhemp, pulses, groundnut, castor, gingerly, safflower, sunflower, mustard, cumin, fennel, spinach, amaranthus and tobacco,. Common phytophagous mites, rodents and bird pests.

**Unit VII:** Weeds: Introduction, harmful and beneficial effects, classification, propagation and dissemination; Weed biology and ecology, crop weed association, crop weed competition and allelopathy. Concepts of weed prevention, control and eradication; Methods of weed control: physical, cultural, chemical and biological. Integrated weed management; Herbicides: advantages and limitation of herbicide usage in India, Herbicide classification, formulations, methods of application; Introduction to Adjuvants and their use in herbicides; Selectivity of herbicides; Compatibility of herbicides with other agro chemicals; Weed management in major field and horticultural crops, shift of weed flora in cropping systems, aquatic and problematic weeds and their control. Herbicide resistant crops.

## **Practical**

Study of terrestrial and pond ecosystems of insects; Studies on behaviour of insects and orientation (repellency, stimulation, deterancy); Study of distribution patterns of insects, sampling techniques for the estimation of insect population and damage; Pest surveillance through light traps, pheremone traps and field incidence; Practicable IPM practices, Mechanical and physical methods; Practicable IPM practices, Cultural and biological methods; Chemical control, Insecticides and their formulations; Calculation of doses/concentrations of insecticides; Compatibility of pesticides and Phytotoxicity of insecticides; IPM case studies; Identification of beneficial insects - Pollinators, weed killers and scavengers.

Diagnosis of insect pest and diseases.

Identification of disease, their damage symptoms and management of rice and pearl millet; sorghum, maize and wheat; sugarcane; cotton; pulses; tobacco; cumin, fennel and spinach; groundnut, sesamum, sunflower; castor, mustard and safflower; Identification of common phytophagous mites and their morphological characters; Identification of rodents and bird pests.

Identification of pests, their damage symptoms and management of rice and pearl millet; sorghum, maize and wheat; sugarcane; cotton; pulses; tobacco; cumin, fennel and spinach; groundnut, sesamum, sunflower; castor, mustard and safflower; Identification of common phytophagous mites and their morphological characters; Identification of rodents and bird pests.

Terminology used in weed management. Identification of weeds; Survey of weeds in crop fields and other habitats; Preparation of herbarium of weeds; Calculations on weed control efficiency and weed index

## **Suggested Readings**

Agrios, GN. 2010. Plant Pathology. Acad. Press.

Atwal AS & Dhaliwal GS. 2002. Agricultural Pests of South-Asia and Their Management.

Kalyani Publishers.

Dhaliwal GS & Arora R. 1996. Principles of Insect Pest Management. National Agriculture

Technology Information Centre.

Dhaliwal GS, Singh R & Chhillar BS. 2006. Essentials of Agricultural Entomology. Kalyani

Publishers.

Mehrotra RS & Aggarwal A. 2007. Plant Pathology. 7th Ed. Tata Mc Graw Hill

Singh H. 1984. House-hold and Kitchen Garden Pests - Principles and Practices.  
Kalyani  
Publishers.

Singh RS. 2008. Plant Diseases. 8th Ed. Oxford & IBH. Pub. Co.

Singh RS. 2013. Introduction to Principles of Plant Pathology. Oxford and IBH  
Pub. Co.

Tarr SAJ. 1964. The Principles of Plant Pathology. McMillan, London.

Vander Plank, JE. 1975. Principles of Plant Infection. Acad. Press.

General Entomology M.S. Mani  
Sampurna Pak Sanrakshan Part-I ( Gujarati Edition) Babubhai Avarani

Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
3	MRS-CORE-902	CORE	SOIL SCIENCES	2 + 1	30 + 20 + 50 = 100

**Unit 1:** Soil: Pedological and edaphological concepts, Origin of the earth, Earth's crust; Composition: Rocks and minerals Weathering, silicate clays, their genesis and sources of charges, Soil formation factors and processes, Soil as a source of plant nutrients. Essential and beneficial elements, criteria of essentiality, forms of nutrients in soil, factors affecting nutrient availability to plants. Soil fertility - Different approaches for soil fertility evaluation, Factors influencing nutrient use efficiency (NUE) in respect of N, P, K, S, Fe and Zn fertilizers. Source, method and scheduling of nutrients for different soils and crops grown under rainfed and irrigated conditions.

**Unit 2:** Components of soils; Soil profile, Soil physical properties, Soil texture, Textural classes, Particle size analysis, Soil structure Classification, Soil aggregates, significance, Soil consistency, Soil crusting, Bulk density and particle density of soils & porosity, their significance and manipulation, Soil compaction, Soil Colour, Elementary knowledge of soil classification and soils of India and Gujarat.

Problem soils - acid, salt affected and calcareous soils, characteristics, nutrient availabilities, Measures to overcome deficiencies and toxicities. Reclamation - mechanical, chemical and biological methods

**Unit 3:** Soil water, Retention and potentials, Soil moisture constants, Movement of soil water, Infiltration, percolation, permeability, Drainage, Methods of determination of soil moisture Thermal properties of soils, Soil temperature, Soil air, Gaseous exchange, Influence of soil temperature and air on plant growth; Soil colloids, Properties, nature, types and significance; Adsorption of ions, Ion exchange, CEC & AEC Factors influencing ion exchange and its Significance. Fertilizer and insecticides and their effect on soil water and air.



**Unit 4:** Soil organic matter, Composition, Decomposability, Humus, Fractionation of organic matter, Carbon cycle, C: N ratio. Soil biology, Biomass, Soil organisms and their beneficial and harmful roles.

**Unit 5:** Soil testing - Chemical methods, critical levels of different nutrients in soil. Plant analysis - DRIS methods, critical levels in plants. Rapid tissue tests. Indicator plants. Biological method of soil fertility evaluation. Soil test based fertilizer recommendations to crops.

### **Practical**

Determination of bulk density and particle density Soil moisture determination, Soil moisture constants - Field capacity Infiltration rate, water holding capacity, soil texture and mechanical analysis - Soil temperature. Analytical chemistry - Basic concepts, techniques and calculations - Collection and processing of soil for analysis - Organic carbon, pH, EC, CEC, AEC soluble cations and anions - Study of a soil profile - Identification of rocks and minerals.

Principles of analytical Instruments and their calibration and applications, Colorimetry and flame photometry. Estimation of available N, P, K, S, and Zn in oils, pH, EC, soluble cations and anions in soil water extracts. Estimation of Lime requirement and gypsum requirement of problem soils

### **Readings**

Brady Nyle C and Ray R Well. 2002. Nature and properties of soils. Pearson Education Inc.,New Delhi.

Indian Society of Soil Science. 1998. Fundamentals of Soil Science. IARI, New Delhi.

Sehgal J.. A. Textbook of Pedology Concepts and Applications. Kalyani Publishers, New Delhi.

Das DK. 2011. Introductory Soil Science. Third Revised Edition, Kalyani Publishers.

Indian society of soil science (ISSS). 2002. Fundamentals of Soil Science. Published by IndianSociety of Soil Science, IARI, New Delhi

Brady Nyle C and Ray R Well, 2014. Nature and properties of soils. Pearson Education Inc.,New Delhi.

Biswas, T.D. and Mukharjee, S.K., 2015. Text Book of Soil science. Tata Mc Graw Hill PublishingCo. Ltd., New Delhi.

Brady, N. C. and Weil, R. R., 2010. Elements of the Nature and Properties of Soils (3rd Edition), Pearson Education, New Delhi.

Foth, H.D., 1991. Fundamentals of Soil Science (8th Edition), John Wiley & Sons, New Delhi.

Khan, T. O. 2013 Forest Soils: Properties and Management. Springer International Publishing, Switzerland

Pritchett and Fisher RF, 1987. Properties and Management of Forest Soils. John Wiley, NewYork.

Gupta, P.K. 2009. Soil, Plant, Water and Fertilizer Analysis (2nd Edition), AGROBIOS, Jodhpur(India).

Jaiswal, P.C. 2006. Soil, Plant and Water Analysis (2nd Edition), Kalyani Publishers, Ludhiana.

Jackson, M. L. 2012. Soil Chemical Analysis: Advanced Course, Scientific Publisher

Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
3	MRS-CORE-903	CORE	FLORICULTURE AND LANDSCAPING, GARDENING	2 + 1	30 + 20 + 50 = 100

## Theory

**Unit 1** :History, definitions, scope of ornamental horticulture, aesthetic values, Floriculture industry,Importance, area and production, industrial importance of ornamental plants and flowers.Importance, classification, design values and general cultivation aspects for ornamental plants viz.Annuals, biennales herbaceous perennials, grasses and bulbous ornamentals. shrubs, climbers,trees, indoor plants, palms and cycads, ferns and sellagenellas, cacti and succulents, Pot plants: selection, arrangement, management.

**Unit 2** : Scope and importance of commercial floriculture in India, production techniques of commercial flower crops like rose, marigold, chrysanthemum, orchid, carnation, gladiolus, jasmine, frangipani, crossandra, anthurium, dahlia, tuberose, bird of paradise, china aster and gerbera for domestic and export market, production techniques of flowers and foliage filler materials growing of flowers under protected environments such as glass house, plastic house etc., postharvest technology of cut flowers in respect of commercial flower crops, dehydration technique for drying of flowers, production techniques for bulbous.

**Unit 3** : Historical Importance of Indian gardens, Gardens of ancient world, Definitions, Famous gardens of India and abroad, formal, informal, free style and wild gardens, Importance,design and establishment of garden features/components viz. hedge, edge, borders, flower beds,bridges, paths, drives, fences, garden walls, gates, carpet bed, arbour, Patio, decking, retainingwalls, shade garden, sunken garden, roof garden, terrace garden, pebble garden, rockery, pools,waterfalls, fountains, bog garden, avenue planting and children garden. Lawn types, establishmentand maintenance. Bonsai: principles and management

**Unit 4** :Establishment of English garden, Japanese gardens, Mughal, gardens, French and Persian garden, Italian gardens, Hindu gardens and Buddhist gardens, Xeriscaping, definition, principles and practice.

**Unit 5** :Importance of Garden adornments viz. floral clock, bird bath, statues,sculptures, lanterns, water basins, garden benches etc. Importance of flower arrangement,Ikebana, techniques, types, suitable flowers and cut foliage, uses of vertical garden, bottle garden,terrariums, art of making bonsai, culture of bonsai and maintenance.

**Unit 6** :Importance and scope of landscaping. Principles of landscaping, garden styles and types,terrace gardening, vertical gardening, garden components, adornments, lawn making,rockery,water garden, walk-paths, bridges, other constructed features etc. gardens for special purposes.Bio-aesthetic planning: definition, need, planning; landscaping of urban and rural areas, Peri-urban landscaping, Landscaping of schools, public places like bus station, railwaystation, townships, river banks, hospitals, play grounds, airports, industries, institutions. Principles of Landscape gardens viz. Axis, rhythm, balance, time and light, space, texture, form, mass effect, focal point, mobility,emphasis, unity and harmony etc.. Elements of landscape gardens viz. tangible and intangible elements.

### **Practical**

Identification and description of annuals, biennials, herbaceous perennials, climbers, shrubs,trees, indoor plants, ferns and sellagenellas, Palms and cycads and Cacti and succulents. pot plants; Planning and designing and establishment of garden features viz. lawn, hedge and edge, rockery, watergarden, carpet bedding, shade garden, roof garden, Study and creation of terrariums, verticalgarden, study and practice of different types of flower arrangements, preparation of floral bouquets,preparation of floral rangoli, veni etc., Study of Bonsai techniques, Bonsai practicing and training.Visit to nurseries and floriculture units.

Identification of tools and implements used in landscape design, training and pruning of plants for special effects, lawn establishment and maintenance, layout of formal gardens, informal gardens, special type of gardens (sunken garden,terrace garden, rock garden) and designing of conservatory and lathe house. Use of computer software, visit to important gardens/ parks/ institutes.

Study of garden equipments. Study of Graphic language, Use of drawing equipments, graphicsymbols and notations in landscaping designing, Study and designing of different styles of gardens,Study and designing of gardens based on different themes, Designing gardens Designing gardens for home, traffic islands, schools and colleges, public buildings,factories, railway stations, air ports, temples, churches, play grounds, corporate buildings/ malls.Designing and planting of avenues for state and National highways, Design and establishment ofJapanese, English and Mughal gardens. Visit to public, institutional and botanical gardens.

**Suggested Reading:**

Bose, Chowdhury and Sharma.1991.Tropical Garden Plants in colour .Horticulture and alliedpublishers, 3D Madhab Chatterjee street Kolkata.

K.V.Peter.2009Ornamental plants. New India publishing agency, New Delhi.

Richard Bird. 2002. Flowering trees and shrubs. Printed in Singapore by Star Standard

Industries pvt. Ltd.

Bimaldas Chowdhury and Balai Lal Jana.2014.Flowering Garden trees. Pointer publishers,Jaipur. India.

Arora, J.S. 2006. Introductory Ornamental Horticulture. Kalyani Publishers, Ludhiana

Randhawa, G.S. Amitabha Mukhopadhyay, 2004. Floriculture in India. Allied Publishers Pvt.Ltd., New Delhi.

Bose, T.K. Mukherjee, D. 2004. Gardening in India. Oxford & IBH Publishers.

Chadha, K.L. and Chaudhary, B. 1986. Ornamental Horticulture in India. Publication

andInformation Division. ICAR,NewDelhi.

A.K. Tiwari and R. Kumar. 2012. Fundamentals of ornamental horticulture and landscapegardening. New India.

H.S.Grewal and Parminder Singh. 2014. Landscape designing and ornamental plants

R.K. Roy. Fundamentals of Garden designing.2013.New India publishing agency, Pitampura,New Delhi.

Rajesh Srivastava. 2014. Fundamentals of Garden designing. Agrotech press, Jaipur, New Delhi.

L.C. De. Nursery and landscaping.2013. Pointer publishers, Jaipur India.

Bose, T.K. Malti, R.G. Dhua, R.S. & Das, P. 2004. Nayaprakash, Calcutta.  
Floriculture  
and Landscaping

Arora, J.S. 2006. Kalyani publishers, Ludhiana. Introductory Ornamental  
Horticulture.

Kalyani publishers, Ludhiana.

Randhawa, G.S. and Amitabha Mukhopadhyay 2004. Floriculture in India.  
Allied PublishersPvt. Ltd., New Delhi.

Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
3	MRS-CORE-904	CORE	AROMATIC, MEDICINAL AND SPICES CROPS	2 + 1	30 + 20 + 50 = 100

### Theory

**Unit 1:**History, scope, opportunities and constraints in the cultivation and maintenance of medicinal and aromatic plants in India. Importance, origin, distribution, area, production, climatic and soil requirements, propagation and nursery techniques, planting and after care, cultural practices, training and pruning, nutritional and water requirements.

**Unit 2:**Plant protection, harvesting and processing of under mentioned important medicinal and aromatic plants. Study of chemical composition of a few important medicinal and aromatic plants, extraction, use and economics of drugs and essential oils in medicinal and aromatic plants. Therapeutic and pharmaceutical uses of important species. Storage techniques of essential oils.

**Unit 3:**Medicinal Plants: Withania, periwinkle, Rauwolfia, Dioscorea, Isabgol, opium poppy Ammi majus, Belladonna, Cinchona, Pyrethrum, clove, aloe, guggul, nuxvomica, Solanum khasiamum, aonla, senna, plantago, stevia, coleus and Acorus..and other species relevant to local conditions

**Unit 4:**Aromatic Plants: Citronella grass, khus grass, flag (baje), lavender, geranium, patchouli, bursera, menthe, musk, occimum, lemon grass, palmarose, vetiver, dawana; and other species relevant to the local conditions. Marketing.

**Unit 5:**Plantation Crops Importance and cultivation technology of Spices - ginger, turmeric, pepper, cardamom, coriander, cumin, fenugreek

### Practical

Botanical description and identification of aromatic plants; Identification of varieties in spices and Identification of medicinal plants & spices

Collection of medicinal and aromatic plants from their natural habitat and study their morphological description, nursery techniques, harvesting, curing and processing techniques and extraction of essential oils.

Propagation and planting methods in spices, aromatic & medicinal plants

Harvesting procedures in spices, aromatic & medicinal plants

Processing and curing of spices

Distillation procedures for aromatic crops

Products - byproducts of spices and plantation crops

Visit to local commercial plantations. Aromatic & medicinal plant nurseries and seed spices field.

**Suggested Reading:**

Chadha, K.L. ICAR, 2001. Hand Book of Horticulture. Directorate of Information and

Publications of Agriculture, Pusa, New Delhi.

Azhar Ali Farooqui and Sreeramu, B.S. 2001. Cultivation of medicinal and aromatic plants. United Press Limited.

Kumar, N. J.B.M. Md. Abdul Khaddar, Ranga Swamy, P. and Irulappan, I. 1997. Introduction to Spices, Plantation Crops Medicinal and Aromatic Plants. Oxford & IBH, New Delhi.

Dastur, J.F. 1982. Medicinal plants of India Pakistan Taraprevalasoms and co-private Ltd, Mumbai.



Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
3	MRS-CORE-905	CORE	INTRODUCTION TO DAIRY FARMING, PROCESSES&DAIRY COOPERATIVES	2 + 1	30 + 20 + 50 = 100

**Theory :**

**Unit I :**Present status of livestock products industry in India - dairy, meat poultry, skin, hides, wool, etc; Importance of Dairy Industry, Milk Production in the world : An overview. Milk consumption & availability per capita, Dairy Products- Manufacturing technologies of various dairy products and by-product utilization. WTO and meat, dairy Industry, WHO/international laws/requirements for human foods (dairy and meat).

**Unit II :**Milk& Milk chemistry : Milk types and their specifications, Milk products & processing including curds, cream, butter, ghee, ice-cream, cheese, condensed and dried milks, infant food, spoilage of ghee etc.

**Unit III :**Milk sampling and primary milk testing, Special milks and their definition.

Sources of Contamination of Milk and control measures.

**Unit IV :**Storage of Milk : methods and advantages : Heating, Chilling & by adding preservatives.

**Unit V :**Diseases transmitted through milk and their preventive measures, Adulteration in milk and its test : Adulterants used and their testing methods. Milk testing : society level & dairy level. Measures of Clean milk Production.

**Unit VI :**Dairy Farming, Important points to Starting a Dairy Farm, Important points for selection of dairy animals, Important points for maintaining continuous higher milk production in dairy farming, Types of Dairy Farming: Mixed farming, specialized farming and Community farming, Important points for profitable dairy farming, Routine daily operations for dairy farming, Care and management of dairy animals in summer, winter and monsoon

**Practical:**

Visit cooperative Dairy Unit

Learn Milk Sampling Techniques

Measure Milk Production

Selection of Animals for Dairy Farming  
Study of Various Methods of Dairy Farming  
Observation of Routine Day to Day Functioning of Dairy Farming  
Machines used in Dairy Farming

**References :-**

Text Book of Dairy Science - Henny, Judkin  
Dairying in India - A Review - D. N. Kharady  
Dairy Microbiology - K. C. Mahanta  
PashuVyavastha: Arun D. Dave, University Granth Nirman Board, Ahmedabad.  
Dairy Vigyan: C.H. Joshi, University Granth Nirman Board, Ahmedabad.  
DudhaneDudhniBanavato: B.M. Patel, S.H. Vyas, University Granth Nirman Board  
Vyavaharu Gopalan: Krushnalal Shukul, University Granth Nirman Board,  
Ahmedabad.  
"Godarshan" Dept. of A.H., Gujarat State, Gandhinagar.  
A Text Book of Animal Husbandry: G.C. Banerjee, Oxford & IBH Ltd., New  
Delhi.  
A Text Book of Animal Husbandry: G.C. Banerjee, Oxford & IBH Ltd., New  
Delhi.  
A Hand book of Animal Science by Amalendu Chakraborti  
A Hand Book of Animal Husbandry: By - ICAR, New Delhi.  
Principals and Practices of Dairy Farm Management: By Jagdish Prashad

Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
3	MRS-CORE-906	CORE	INTRODUCTION TO VETERINARY SCIENCE	2 + 1	30 + 20 + 50 = 100

**Theory:**

**Unit I :**Types and importance of treatment, Identification of healthy and sick animals and their signs

**Unit II :**Classification of diseases: Infectious and non infectious diseases; Important bacterial disease of cattle and their preventive measures; Important viral diseases of cattle their signs and preventive measures

Disease of Digestive system of cattle

Disease of Respiratory system of cattle

Disease of udder and teats of cattle

Disease of urinary system of cattle

Important metabolic diseases of cattle

Important parasitic diseases of cattle and their control measures

Different pollutants and their effects on animals

**Unit III :**Methods of medication: different routes and their usefulness, Study of common Ayurvedic and allopathic preparations used in cattle, Vaccine and Antiserum: Types of vaccines, Immunity: Body defence mechanism, Types of Immune system and their organs

**Unit IV :**Importance of Veterinary public Health and the fields of VPH  
 Definition and classification of zoonosis, Spread of zoonosis and cause of spread of zoonotic diseases in human.Pathogenesis of zoonosis, Control and preventive measure of zoonosis Zoonotic disease spread by milk, Important bacterial zoonotic diseases like T.B. Brucellosis, Anthrax, Leptospirosis, and etc, Important viral, fungal and parasitic zoonotic diseases, Rabies, FMD, Swine flu, Bird flu, etc., Food poisoning

**Practical:**

- (1) To study important signs of healthy animal.
- (2) To study important signs of sick animal.
- (3) A visit to a Veterinary Dispensary and to study its services.
- (4) To attend and participate a Veterinary Clinical camp.

- (5) To study Preventive measures of infectious diseases.
- (6) Understanding digestive system/respiratory system of cattle
- (7) Simple methods of medication
- (8) Application of certain Ayurvedic/home remedies.
- (9 )Study characteristics of Veterinary epidemics & its' impact on human life
- (10) Prevention of Veterinary epidemics

**Reference Books:-**

1. A text book of animal husbandry - G.C.Banerjee
2. A hand book of animal husbandry - I.C.A.R.
3. Animal management: introduction animal science - James J. Kiser
4. Domestic animal - Harbans Singh
5. Dairying in India a review - D.N. Kharady
6. ChikitsaVigyananaMulTatvo- Buch&Buch
7. The artificial insemination of farm animals - E.J. Perry
- 8 ."Godarshan" Dept. of A.H., Gujarat State, Gandhinagar.
- 9 .Food hygiene and Veterinary public Health by J.M Anjariya.
10. Dairy Science by C.J Joshi.

Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
3	MRS-CORE-907	CORE	AGRICULTURAL ECONOMICS & MARKETING	2 + 1	30 + 20 + 50 = 100

### Theory

**Unit 1:** Economics: Meaning, scope and subject matter, definitions, activities, approaches to economic analysis; micro and macro economics, positive and normative analysis. Nature of economic theory; rationality assumption, concept of equilibrium, economic laws as generalization of human behavior.

**Unit 2:** Economic systems: Concepts of economy and its functions, important features of capitalistic, socialistic and mixed economies, elements of economic planning.

Basic concepts: Goods and services, desire, want, demand, utility, cost and price, wealth, capital, income and welfare.

**Unit 3:** Agricultural economics: meaning, definition, characteristics of agriculture, importance and its role in economic development. Agricultural planning and development in the country.

Agricultural and public finance: meaning, micro v/s macro finance, need for agricultural finance, public revenue and public expenditure. Tax: meaning, direct and indirect taxes, agricultural taxation, GST

**Unit 4:** Banking: Role in modern economy, types of banks, functions of commercial and central bank, credit creation policy.

**Unit 5:** Agricultural Marketing: Concepts and definitions of market, marketing, agricultural marketing, market structure, marketing mix and market segmentation, classification and characteristics of agricultural markets

**Unit 6:** Meaning and stages in PLC; characteristics of PLC; strategies in different stages of PLC; pricing and promotion strategies: pricing considerations and approaches - cost based and competition based pricing; market promotion - advertising, personal selling, sales promotion and publicity - their meaning and merits & demerits;

**Unit 7:** Marketing process and functions: Marketing process - concentration, dispersion and equalization; exchange functions - buying and selling; physical functions - storage, transport and processing; facilitating functions - packaging, branding, grading, quality control and labeling (Agmark); Market functionaries and marketing channels:

**Unit 8:** Risk in marketing: Types of risk in marketing; speculation & hedging; an overview of futures trading; Agricultural prices and policy: Meaning and functions of price; administered prices; need for agricultural price policy; Trade: Concept of International Trade and its need, theories of absolute and comparative advantage.

**Unit 9:** Role of Govt. in agricultural marketing: Public sector institutions - CWC, SWC, FCI, CACP & DMI - their objectives and functions; cooperative marketing in India;

Present status and prospects of international trade in agri-commodities; GATT and WTO; Agreement on Agriculture (AoA) and its implications on Indian agriculture; IPR.

### **Practical**

Plotting and study of demand and supply curves and calculation of elasticities;

Study of relationship between market arrivals and prices of some selected commodities; Computation of marketable and marketed surplus of important commodities;

Study of price behaviour overtime for some selected commodities; Construction of index numbers;

Visit to a local market to study various marketing functions performed by different agencies, identification of marketing channels for selected commodity, collection of data regarding marketing costs, margins and price spread and presentation of report in the class;

Visit to market institutions - NAFED, SWC, CWC, cooperative marketing society, etc. to study their organization and functioning;

Application of principles of comparative advantage of international trade.

## **Readings**

Agricultural Economics 2<sup>nd</sup>Ed (PB 2019)by Reddy S S

Agricultural Economicsby Dr. S. R. KantwaDr. S. V. Sai Prasad, Dr. K. Srinivas, Dr. Vikas Kumar, 1 April 2014

Leading issues in agricultural economics (english)by R.N. Soni | 1 January 2015

Fundamentals of Agricultural Economicsby Verma P K | 1 January 2019

Agricultural Economics An Indian Perspectiveby R.K. Lekhi& Joginder Singh | 1 January 2015

Economics of Agricultural Production and Farm Managementby J. M. Dhaka | 1 January 2010

Introduction to Agricultural Economics | Sixth Edition | By Pearsonby John B. Penson, Oral Capps, et al. | 30 June 2019

Introduction to Agricultural Economics and Agri Business Managementby Talathi Naik | 2 April 2008

Agricultural Marketing In Indiaby S.S. Acharya and N.L. Agarwal | 28 February 2021

Agricultural Marketing by Sawalia Bihari Verma | 1 January 2017

Agricultural Marketing and Price Analysisby F. Bailey Norwood and Jayson L. Lusk | 11 April 2018

Emerging Trends in Agricultural Marketing in Indiaby Ashok M. V | 1 January 2021

Agricultural Marketing: Problems and Prospectsby Rajan Kumar Sahoo | 1 January 2011

Text Book Of Agricultural Marketing And Cooperationby L K Wader | 1 January 2003

Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
3	MRS-CORE-908	CORE	Introduction to Social Work	2 + 1	30 + 20 + 50 = 100

## THEORY

### Unit I :Social Work History & Ideologies

Indian History of Social Work Profession: Introduction, Social Work Education, Welfare vs Development, Goals, Values, Professional and Voluntary Social Work Contemporary Indian Ideologies for Social Work Profession: Gandhian, Dalit, Ideology of Indian Constitution.

Western History of Ideologies for social change: Beginning of Social Work, Organized and Scientific Charity, Clinical Social Work, goals, values, roles, and process of social work.

### Unit II :Methods of Social Work

**Case Work:** Different methods of working with people. Scope of case work as a method of working with individual. Traditional ways of helping individual. Definition of social case work understanding components of case work. Social Case Work Process: Registration and intake, Psychosocial study, Social diagnosis, Treatment etc.

**Group Work:** Social Group, Functions and types of small groups. Individual and groups, some general characteristic of group life., Social group work as a method of helping people., Specific objectives of group work, values and principles underlying work with groups., Process of group work in the various phases of a group. Group formation, Promulgation of objective and planning, Assessment, Middle phase, Termination, Evaluation

### Unit III :Working with Communities

Basic concepts & definition of types of communities, analysis of structures and functions of the community. Community organization as a method of intervention and its scope, principles of community organization and definitions of community organizations Methods of identifying community problems, factors affecting integration and disintegration of community life.

Identification, mobilization & utilization of community resources within and outside the community through community organization & participation. Service of delivery for target groups, eligibility criteria, types of service.

## PRACTICAL

1. Preparing Charts about History & Ideology of Social Work (Indian/Western)
2. Case Work Process Case Study, Analysis & Report



3. Group Work Process Case Study, Analysis Report
4. Visit to Community / Community Centre / Organization

## REFERENCES

- Chatterjee, P. 1996: Approaches to the welfare state, Washington, D.C. National Association of Social Workers.
- Desai, M. 2000: Curriculum Development on History of Ideologies for Social Change and Social Work, Mumbai - Social Work Education and Practice cell.
- University Grants Review of Social Work Education in India: Retrospect and Prospect ,New Delhi: UGC Curriculum.
- Balagopal P.R. and Vassil Group in Social Work. An Ecological Perspective T.V. Manemaliam Publishing Co. New York. 1983
- Friedlander W.A. Concepts and Methods of Social Work. Englewood Cliffs: Prentice Hall. 1978
- Mathew G. Case Work in Encyclopedia of Social Work in India. Delhi: Ministry of Social Welfare, 1987.
- Mathew G. An Introduction to Social Case Work. Bombay: TISS. 1991
- Community Organization In India, Bombay Popular Prakashan 1971

Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
3	MRS-MDC-901	MULTI DISCIPLINARY	RESEARCH METHODOLOGY & SCIENTIFIC/ TECHNICAL WRITING	2 + 1	30 + 20 + 50 = 100

## Theory

**Unit 1 :** Concept, nature and importance of Social Work Research Types of research - Fundamental vs. Applied. Concept of researchable problem, research prioritization - selection of research problem. Approach to research - research process.

**Unit 2 :** Research Process- Formulation of Problem, Hypothesis& it's types, Designing the study, Data collection, Data Processing, analysis and interpretation, Writing the Research Report.

**Unit 3 :** Techniques of Data Collection- interview Schedule, Questionnaire observation and case Study, Quantitative Methods, Qualitative Methods,

**Unit 4 :** Sampling Techniques. Sources of Data Collection: primary and Secondary data, Elements of Sampling, Meaning of Sample, Sampling Strategy, Data Collection and Processing, Primary and Secondary data, Interviewing and Observation, Structured and Unstructured Interviews

**Unit 5 :** Coding editing - tabulation - validation of data. Basics of Statistics, Mean, Median Mode, Significance Tests, Statistical Tools

**Unit 6:** Various forms of scientific writings- thesis, technical papers, reviews, manuals, etc; Various parts of thesis and research communications (title page, authorship contents page, preface, introduction, review of literature, material and methods, experimental results and discussion); Writing of abstracts, summaries, précis, citations etc.; commonly used abbreviations in the theses and research communications; illustrations, photographs and drawings with suitable captions; pagination, numbering of tables and illustrations; Writing of numbers and dates in scientific write-ups; Editing and proof-reading; Writing of a review article.

**Unit 7:** Report Writing, Presentation, Proposal Writing, Oral Presentation of Findings

**Unit 8:** Project proposals - contents and scope - different types of projects to meet different needs - trade-off between scope and cost of the study.  
Research design and techniques - Types of research design.

**Practical:**

Exercises in problem identification. Project proposals - contents and scope.

Formulation of Objective and hypotheses.

Assessment of data needs sources of data - methods of collection of data.

Methods of sampling criteria to choose - discussion on sampling under different situations.

Scaling Techniques - measurement of scales. Preparation of interview schedule - Field testing.

Method of conducting survey.

Exercise on coding, editing, tabulation and validation of data.

Preparing for data entry into computer.

Hypothesis testing - Parametric and Non-Parametric Tests.

Exercises on format for Thesis / Report writing. Presentation of the results.

The student should submit a research proposal on any subject of his liking clearly indicating Purpose of Research, Methodology of Research, Hypothesis, Potential Sample and Sampling Strategy and Benefit of Research.

**Bibliography:**

- 1) Research Methodology, R C Kothari
- 2) Handbook of Research Methods, Sage Publications
- 3) Black TR. 1993. Evaluating Social Science Research - An Introduction. SAGE Publ.
- 4) Creswell JW. 1999. Research Design - Qualitative and Quantitative Approaches. SAGE Publ.
- 5) Dhondyal SP. 1997. Research Methodology in Social Sciences and Essentials of Thesis Writing. Amman Publ. House, New Delhi.
- 6) Richard WS. 1969. Technical Writing. Barnes & Noble. Chicago Manual of Style. 14th Ed. 1996. Prentice Hall of India.
- 7) Wren PC & Martin H. 2006. High School English Grammar and Composition. S. Chand & Co.
- 8) MLA Handbook

Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
4	MRS-MDC-902	MULTIDISCIPLINARY	CONCEPTUAL STUDIES IN SOCIAL SCIENCES	3	50 + 50 =100

### સમાજશાસ્ત્ર

- ૧.૧ સમાજશાસ્ત્રની વ્યાખ્યા અર્થ અને સમાજશાસ્ત્રના અભ્યાસની અગત્યતા
- ૧.૨ સમાજ અને સંસ્કૃતિની વ્યાખ્યા અર્થ અને લક્ષણો
- ૧.૩ ભારતીય ગ્રામીણ સમાજ અને સામાજિક માળખાનો અભ્યાસ , રચના, ઔદ્યોગિક અને બિન ઔદ્યોગિક સમાજ ,સ્થાન ,દરજ્જો અને ભૂમિકા (જાણો )
- ૧.૪ સામાજિક સંસ્થાઓ અને સામાજિક જૂથો , વ્યાખ્યાની સમજૂતી કાર્યો , જાતિપ્રથા અને વર્ણવ્યવસ્થા
- ૧.૫ સામાજિક ક્રાંતિ , સામાજિક ચળવળ , સામાજિક પરિવર્તનની વ્યાખ્યા, અર્થ, લક્ષણો, પરિબળો

### અર્થશાસ્ત્ર

- ૨.૧ અર્થતંત્રની સંકલ્પનાઓ કલ્યાણકારી, મૂડીવાદી ,સમાજવાદી અને મિશ્ર અર્થતંત્રની વિભાવના
- ૨.૨ અર્થશાસ્ત્રની વ્યાખ્યા , અર્થ, અર્થશાસ્ત્રનો અન્ય શાસ્ત્રો સાથે સબંધ અર્થશાસ્ત્રના અભ્યાસની અગત્યતા
- ૨.૩ અર્થતંત્રની નવીન સંકલ્પનાઓ , ઉદારીકરણ, ખાનગીકરણ, વૈશ્વીકરણ

### રાજ્યશાસ્ત્ર

- ૩.૧ રાજ્યશાસ્ત્રની વ્યાખ્યા, અર્થ, ખ્યાલ અને રાજ્યશાસ્ત્રના અભ્યાસની અગત્યતા
- ૩.૨ લોકશાહી રાજ્યવ્યવસ્થા અને લોકશાહીના મૂલ્યો
- ૩.૩ રાજ્યશાસ્ત્રનો ઉદભવ, વિકાસ અને વ્યક્તિ, સમાજ અને રાજ્યના ઉદભવ, સબંધની ઐતિહાસિક, પરિપેક્ષક અને રાજ્ય વ્યવસ્થા
- ૩.૪ ભારતીય બંધારણની રચના તેનું સંગઠન , કાર્યો

### મનોવિજ્ઞાન

- ૪.૧ મનોવિજ્ઞાનનો અર્થ , સંકલ્પનાઓ, માનસશાસ્ત્રના અભ્યાસની અગત્યતા
- ૪.૨ મનોવિજ્ઞાનના અભ્યાસનો ખ્યાલ અને વિવિધ પદ્ધતિઓનો અભ્યાસ જેવી કે (વિકાસ અને અભ્યાસ સમસ્યાનો ઉકેલ)
- ૪.૩ માનવ વિકાસના કેટલાક તબક્કા, પ્રક્રિયા અને સમાજ જીવનમાં વ્યક્તિત્વની પ્રક્રિયા અને તેના સિધ્ધાંત અને વારસો અને વાતાવરણની અસર
- ૪.૪ નૈતિકતાનો ખ્યાલ નૈતિકતાની લાક્ષણિકતાઓ, કાર્યો અને માનવ વર્તનના પ્રકારો (વ્યક્તિગત, જૂથ, સમુદાય)
- ૪.૫ સમૂહ ગ્રામીણ સમાજનો અભ્યાસ

## ગાંધી વિચાર અને સમાજવિજ્ઞાનનો સંબંધ

- પ.૧ ગાંધીજીના સામાજિક વિચારો
- પ.૨ ગાંધીજીના આર્થિક વિચારો અને વિકેન્દ્રીકરણ અને ટ્રસ્ટીશીપનો સિદ્ધાંત
- પ.૩ ગાંધીજીના રાજકીય વિચારો
- પ.૪ અહિંસાનો સિદ્ધાંત અને ગાંધીજીના સામાજિક વિચારો
- પ.૫ ગાંધીજીના ધાર્મિક અને શૈક્ષણિક વિચારો

### ફિલ્ડવર્ક

- ગ્રામ સામાજિકરણની વિવિધ એજન્સીઓમાંથી કોઈ એક નો અભ્યાસ કરવો
- ગ્રામ સમાજની સાંસ્કૃતિક બાબતનો અભ્યાસ કરવો (હાટ , લોકમેજો, તહેવારની ઉજવણી , સાંસ્કૃતિક કાર્યક્રમ)
- ગ્રામ પંચાયત દ્વારા લેવાતા વેરા અને તેનો ગ્રામ વિકાસમાં થતા ઉપયોગનો અભ્યાસ
- રાજ્ય સરકાર દ્વારા ગ્રામીણ સ્વતંત્રતાને રક્ષણ માટેની જોગવાઈઓનો અભ્યાસ
- વર્તમાન સમયમાં ગાંધી મૂલ્યોના અમલીકરણની ચકાસણી ખાદી ,ગ્રામોદ્યોગ, સત્ય, અહિંસા, સર્વધર્મ સમભાવ, અસ્પૃશ્યતા)

### ❖ સંદર્ભ ગ્રંથ

- પ્રો. એ. જી. શાહ / પ્રો. જે. કે. દવે - આધુનિક ભારતમાં સામાજિક પરિવર્તન
- પ્રો. એ. જી. શાહ / પ્રો. જે. કે. દવે- ગ્રામીણ અને નગર સમાજશાસ્ત્ર
- પ્રો. બારોટ કે. સી. - ભારતનું બંધારણ સંક્ષિપ્તમાં
- પ્રો. નાયક ડી. બી. - ભારતનો બંધારણીય કાયદો
- અંજન બી. ન. ધારૈયા - ગાંધીજીનું સમાજ સુધારણામાં પ્રદાન મશરૂવાલા કિશોર - ગાંધી વિચાર દોહન

Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
3	MRS-FOU-901	FOUNDATION	INTRODUCTION TO HUMAN RIGHTS	0	100

### **Theory**

**Unit – I** Human Rights: Concept and Classification Society and Development

**Unit – II** Concepts: Values, Ends, Social Control, Liberty, Equality, Justice, Unity in Diversity.

**Unit – III** Human Rights and Duties in India: Constitutional Frame Work Protection and Enforcement mechanism of HR and Duties in India

**Unit – IV** Universal Declaration of Human Rights – 1948, International Convention of Civil and Political Rights – 1966, International Convention on Economic, Social and Cultural Rights – 1966, UN Declaration and Duties and Responsibilities of Individuals 1997

### **Practical**

Preparing comparison charts

Study Report

Presentation / Seminar

Case Study

### **Readings**

Human Rights, H O Agrawal

Textbook On Human Rights Law And Practice, Jain Rashee

Human Rights: An Overview, Pushpavalli

UDHR Declaration

ICCPR Declaration

ICESCR Declaration

UN DDRI Declaration

Fundamental Rights & Duties in Constitution of India

**MRS SEM 4**



Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
4	MRS-CORE-1001	CORE	ADVANCE CONCEPTS IN AGRICULTURE	2 + 1	30 + 20 + 50 = 100

### **UNIT 1 :FARM POWER &MACHINERY**

Importance of farm equipment and role of mechanization in enhancing productivity & profitability of Indian agriculture; analysis of forces, design and production of farm machinery and power units; mechanics of tillage & traction operation, repair and maintenance of farm machines and equipment, farm engines;

Tractors and power tillers; tractor stability and operator's comfort; field capacity and cost analysis; test codes and procedure; safety and ergonomic principles.

Role of energy in economic development; solar, wind and bio-energy; biogas plants & gasifiers; biofuels from biomass; collection, characterization and storage of biomass, solar refrigerators

### **UNIT 2 :SOIL & WATER CONSERVATION ENGINEERING**

Introduction to Soil and Water Conservation, causes of soil erosion. Definition and agentsof soil erosion, water erosion: Forms of water erosion.

Gully classification and control measures.Soil loss estimation by universal Loss Soil Equation. Soil loss measurement techniques. Principlesof erosion control: Introduction to contouring, strip cropping. Contour bund. Graded bund andbench terracing. Grassed water ways and their design.

Water harvesting and its techniquesWind erosion: mechanics of wind erosion, types of soil movement.

Principles of wind erosion controland its control measures.

### **UNIT 3 :INTRO TO GENETICS**

Pre and Post Mendelian concepts of heredity, Mendelian principles of heredity.Architecture of chromosome; chromonemata, chromosome matrix, chromomeres, centromere,secondary constriction and telomere; special types of chromosomes. Chromosomal theory ofinheritance- cell cycle and cell division-mitosis and meiosis. Probability and Chi-square.Dominance relationships, Epistatic interactions with example.

### **UNIT 4 :PLANT BREEDING**

Historical development, concept, nature and role of plant breeding, major achievements and future prospects; Genetics in relation to plant breeding, modes of reproduction and apomixes, self-incompatibility and male sterility-genetic consequences.

Domestication, Acclimatization and Introduction; Centres of origin/diversity, components of Genetic variation; Heritability and genetic advance; Genetic basis and breeding methods in self-pollinated crops - mass and pure line selection, hybridization techniques and handling of segregating population; Multiline concept.

Genetic basis and methods of breeding cross pollinated crops, modes of selection; Population improvement Schemes-Ear to row method, Modified Ear to Row, recurrent selection schemes; Heterosis and inbreeding depression, development of inbred lines and hybrids, composite and synthetic varieties; Breeding methods in asexually propagated crops, clonal selection and hybridization; Maintenance of breeding records and data collection; Wide hybridization and prebreeding; Polyploidy in relation to plant breeding, mutation breeding-methods and uses; Breeding for important biotic and abiotic stresses; Biotechnological tools-DNA markers and marker assisted selection. Participatory plant breeding; Intellectual Property Rights, Patenting, Plant Breeders and Farmer's Rights.

## **UNIT 5 :PRINCIPLES OF SEED TECHNOLOGY**

Seed and seed technology: introduction, definition and importance. Deterioration causes of crop varieties and their control; Maintenance of genetic purity during seed production, seed quality; Definition, Characters of good quality seed, different classes of seed. Foundation and certified seed production of important cereals, pulses, oilseeds, fodder and vegetables. Seed certification, phases of certification, procedure for seed certification, field inspection. Seed Act and Seed Act enforcement. Duty and powers of seed inspector, offences and penalties. Seeds Control Order 1983, Varietal Identification through Grow Out Test and Electrophoresis, Molecular and Biochemical test. Detection of genetically modified crops, Transgene contamination in non-GM crops, GM crops and organic seed production.

Seed drying, processing and their steps, seed testing for quality assessment, seed treatment, its importance, method of application and seed packing. Seed

storage; general principles, stages and factors affecting seed longevity during storage. Measures for pest and disease control during storage. Seed marketing: structure and organization, sales generation activities, promotional media. Factors affecting seed marketing, Role of WTO and OECD in seed marketing. Private and public sectors and their production and marketing strategies.

## **PRACTICAL**

Study of different components of I.C. engine. To study air cleaning and cooling system of engine, Familiarization with clutch, transmission, differential and final drive of a tractor, Familiarization with lubrication and fuel supply system of engine, Familiarization with brake, steering, hydraulic control system of engine, Learning of tractor driving, Familiarization with operation of power tiller, Implements for hill agriculture, Familiarization with different types of primary and secondary tillage implements: mould plough, disc plough and disc harrow. Familiarization with seed cum-fertilizer drills their seed metering mechanism and calibration, planters and transplanter Familiarization with different types of sprayers and dusters Familiarization with different intercultivation equipment, Familiarization with harvesting and threshing machinery.

General status of soil conservation in India. Calculation of erosion index. Estimation of soil loss. Measurement of soil loss. Preparation of contour maps. Design of grassed water ways. Design of contour bunds. Design of graded bunds. Design of bench terracing system. Problem on wind erosion.

Study of microscope. Study of cell structure. Mitosis and Meiosis cell division. Experiments on monohybrid, dihybrid, trihybrid, test cross and back cross, Experiments on epistatic interactions including test cross and back cross, Practice on mitotic and meiotic cell division, Experiments on probability and Chi-square test. Determination of linkage and cross-over analysis (through two point test cross and three point test cross data). Study on sex linked inheritance in *Drosophila*. Study of models on DNA and RNA structures.

Seed production in major cereals: Wheat, Rice, Maize, Sorghum, Bajra and Ragi. Seed production in major pulses: Urd, Mung, Pigeonpea, Lentil, Gram,

Field bean, pea. Seed production in major oilseeds: Soybean, Sunflower, Rapeseed, Groundnut and Mustard. Seed production in important vegetable crops. Seed sampling and testing: Physical purity, germination, viability, etc. Seed and seedling vigour test. Genetic purity test: Grow out test and electrophoresis. Seed certification: Procedure, Field inspection, Preparation of field inspection report. Visit to seed production farms, seed testing laboratories and seed processing plant.

Plant Breeder's kit, Study of germplasm of various crops. Study of floral structure of self-pollinated and cross pollinated crops. Emasculation and hybridization techniques in self & cross pollinated crops. Consequences of inbreeding on genetic structure of resulting populations. Study of male sterility system. Handling of segregation populations. Methods of calculating mean, range, variance, standard deviation, heritability. Designs used in plant breeding experiments, analysis of Randomized Block Design. To work out the mode of pollination in a given crop and extent of natural out-crossing. Prediction of performance of double cross hybrids.

## **REFERENCES**

- A Textbook of Farm Machinery & Power Engineering by Basavaraj, D Srigiri, et al. | 5 July 2019
- Farm Power And Machinery Engineering by Suresh R
- Farm Power & Machinery by Er Sanjay kumar | 1 January 2018
- Soil And Water Conservation Engineering by R. Suresh | 7 December 2020
- Soil and Water Conservation Engineering by Glenn O. Schwab, Delmar D. Fangmeier, et al.
- Soil and Water Conservation Engineering by William Fangmeier, William J. Elliott, et al.
- Introductory Soil and Water Conservation Engineering by Sanoj Kumar, Ashok Kumar, et al
- Handbook of Genetics and Plant Breeding Paperback, Rajesh Yadav
- Key Notes on Genetics and Plant Breeding (PB) Paperback by Venkata R Prakash Reddy
- Genetics & Plant Breeding Hardcover - by Sunil Kumar M P Singh
- Plant Breeding and Genetics at a glance Paperback -by ID Tyagi
- Principles of Seed Technology R L Agrawal

Principles Of Seed Technology - As Per ICAR New Syllabus by PK Upadhyay

Principles of Seed Technology by Phundan Singh

Seed Science And Technology: 2nd Enlarged And Fully Revised Edition by  
Vanangamudi K

Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
4	MRS-CORE-1002	CORE	ADVANCE CONCEPTS IN HORTICULTURE	2 + 1	30 + 20 + 50 = 100

### **UNIT 1 :FOOD TECHNOLOGY**

Food and its function, physico-chemical properties of foods, food preparation techniques, nutrition, relation of nutrition of good health. Energy, definition, determination of energy requirements, food energy, total energy needs of the body. Mineral nutrition: macro and micro-minerals (Ca, Fe and P), function, utilization, requirements, sources, effects of deficiency. Vitamins: functions, sources, effects of deficiency, requirements of water soluble and fat-soluble vitamins. Balanced diet: recommended dietary allowances for various age groups, assessment of nutritional status of the population.

### **UNIT 2 :INTRO TO GENETICS**

Pre and Post Mendelian concepts of heredity, Mendelian principles of heredity. Architecture of chromosome; chromonemata, chromosome matrix, chromomeres, centromere, secondary constriction and telomere; special types of chromosomes. Chromosomal theory of inheritance- cell cycle and cell division- mitosis and meiosis. Probability and Chi-square. Dominance relationships, Epistatic interactions with example.

### **UNIT 3 :PLANT BREEDING**

Plant breeding as a dynamic science, genetic basis of Plant Breeding - classical, quantitative and molecular, Plant Breeding in India - limitations, major achievements, goal setting for future.

Sexual reproduction (cross and self-pollination), asexual reproduction, pollination control mechanism (incompatibility and sterility and implications of reproductive systems on population structure). Genetic components of polygenic variation and breeding strategies, selection as a basis of crop breeding and marker assisted selection

Hybridization and selection - goals of hybridization, selection of plants; population developed by hybridization - simple crosses, bulk crosses and complex crosses. General and special breeding techniques. Heterosis -

concepts, estimation and its genetic basis. Emasculation, pollination techniques in important horticultural crops. Breeding for resistance of biotic and abiotic stresses. Polyploidy breeding. Mutation breeding.

#### **UNIT 4 :Breeding of Fruit and Plantation Crops**

Fruit breeding - History, importance in fruit production, distribution, domestication and adaptation of commercially important fruits, variability for economic traits, breeding strategies, clonal selection, bud mutations, mutagenesis and its application in crop improvement - policy manipulations - in vitro breeding tools (important fruit and plantation crops).

Flower breeding - History, importance in flower production, distribution, domestication and adaptation of commercially important flowers, variability for economic traits, breeding strategies, clonal selection, bud mutations, mutagenesis and its application in crop improvement - policy manipulations - in vitro breeding tools (important fruit and plantation crops).

## **UNIT 5 :Breeding of Vegetable, Tuber and Spice Crops**

Breeding objectives and important concepts of breeding self pollinated, cross pollinated and vegetatively propagated crops. Plant genetic resources, their conservation and utilization in crop improvement. Breeding for insect resistance, breeding for disease resistance, breeding for abiotic resistance, male sterility and incompatibility and their utilization in development of hybrids.

Origin, distribution of species, wild relatives and forms of vegetable crops Tomato, Brinjal, Bhendi, Capsicum, Chilli, Cucurbits, Cabbage, Cauliflower, Tuber crops, Potato, Carrot, Radish, Spice crops (Ginger, Turmeric). Breeding procedures for development of hybrids/varieties in various crops. Genetic basis of adaptability and stability.

### **PRACTICAL**

Methods of measuring food ingredients, effect of cooking on volume and weight, determination of percentage of edible portion. Browning reactions of fruits and vegetables. Microscopic examination of starches, estimation of energy, value proteins and fats of foods. Planning diet for various age groups.

Study of microscope. Study of cell structure. Mitosis and Meiosis cell division. Experiments on monohybrid, dihybrid, trihybrid, test cross and back cross, Experiments on epistatic interactions including test cross and back cross, Practice on mitotic and meiotic cell division, Experiments on probability and Chi-square test. Determination of linkage and cross-over analysis (through two point test cross and three point test cross data). Study on sex linked inheritance in *Drosophila*. Study of models on DNA and RNA structures.

Breeding objectives and techniques in important horticultural crops. Floral biology - its measurement, emasculation, crossing and selfing techniques in major crops. Determination of mode of reproduction in crop plants, handling of breeding material, segregating generations (pedigree, bulk and back cross methods), Field layout, and maintenance of experimental records in self and cross pollinated crops. Demonstration of hybrid variation and production techniques.

Hardy Weinberg Law and calculation, male sterility and incompatibility studies in horticultural crops calculation of inbreeding depression, heterosis, heterobeltioses, GCA, SCA, GA, heritability.



Exercises on floral biology, pollen viability; emasculation and pollination procedures; hybridseed germination; raising and evaluation of segregating populations; use of mutagens to induce mutations and polyploidy in major crops like Mango, Banana, Citrus, Grapes, Guava, Sapota, Papaya, Custard apple, Aonla, Ber, Litchi, Pomegranate, Jamun, Arecanut, Coconut, Pistachonut, Apple, Pear, Plum, Peach, Apricot and Strawberry.

Floral biology and pollination mechanism in self and cross pollinated vegetables, tuber crops and spices. Working out phenotypic and genotypic heritability, genetic advance. GCA, SCA, combining ability, heterosis, heterobeltosis, standard heterosis, GxE interactions (stability analysis) Preparation and uses of chemical and physical mutagens. Polyploidy breeding and chromosomal studies. Techniques of F1 hybrid seed production. Maintenance of breeding records.

## REFERENCES

- Dr. Swaminathan, M.1985. Food and Nutrition Vol. I & II. BAPPCO, Bangalore.
- Manoranjan, K. and Sangita, S. 1996. Food Preservation and Processing. Kalyani Publishers 978-81-272-4262-6.
- Srilakshmi. 2010. Food Science. New age International 978-81-224-2724-0.
- Anita, T. 1996. Food and Nutrition. Oxford 0198327668
- Key Notes on Genetics and Plant Breeding (PB) Paperback by Venkata R Prakash Reddy
- Genetics & Plant Breeding Hardcover - by Sunil Kumar M P Singh
- Plant Breeding and Genetics at a glance Paperback -by ID Tyagi
- R.W. Allard. Principles of plant breeding. John Wiley & Sons, New York.
- J.R. Sharma. Principles and practices of plant breeding. Tata McGraw Publishing CompanyLtd., New Delhi
- B D Singh. Fundamental of Plant breeding. Kalyani. India.
- Hari Hara Ram, 2013.Vegetable Breeding: Principle and Practices. Kalyani Publishers. Ludhiana.
- Nijar 1985.Fruit breeding in India,Oxford& IBH Publishing Co. New Delhi
- Anil Kumar Shukla 2004. Fruit breeding approaches & Achievements.International Book Distributing Co. New Delhi.
- Kumar, N. 1997. Breeding of Horticultural Crops, Principles and Practices. NewIndia Publishing Agency, New Delhi.
- Singh, B.D. 1983.Plant Breeding Principles and methods. Kalyani Publishers,New Delhi.
- Vishnu Swaroop, 2014. Vegetable Science &Technology in India. Kalyani Publishers. Ludhiana.
- Kallo.G, 1998. Vegetable Breeding (Vol.I to IV). CRC Press. Florida. 1988.
- H.P. Singh, 2009.Vegetable Varieties of India. Studium Press (India) Pvt Ltd. New Delhi.
- M.S. Dhaliwal. 2012. Techniques of Developing Hybrids in Vegetable Crops. Agrobios. Jodhpur.
- P.K.Singh, 2005. Hybrid Vegetable Development. CRC Press. Florida.
- M.S.Dhaliwal, 2009. Vegetable Seed Production & Hybrid Technology. Kalyani Publishers.Ludhiana.

Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
4	MRS-CORE-1003	CORE	ADVANCE CONCEPTS PRODUCTION AND MANAGEMENT OF ANIMAL, POULTRY & FISHES	2 + 1	30 + 20 + 50 = 100

### Theory

#### UNIT 1 :ADVANCES IN CATTLEAND BUFFALO PRODUCTION AND MANAGEMENT

Dairy farming in India and World - Present status and reasons for thesame - Avenues for progress - The needs of the nation and how to achieve it.

Advances in housing management of dairy cattle and buffaloes in variousagroclimatic zone of India - Management systems for cattle and buffaloes.

Establishing Dairy Cattle Enterprise - Characteristics of a successful dairyfarm - Choice of the foundation stock - Breeding Management Problemsassociated with reproduction.

Advances in Feeding Management of cattle and buffalo, Feed for milking herd,dry cows, bulls and calves, Management of high yielding animals.

Milking Management - Biosynthesis of milk - Factors affecting thecomposition and yield of milk - Milking systems

Sanitary standards for the quality milk - Cessation of milking, advances inherd management- raising calves - growing heifers, replacements and culling - marketing, Computerization of dairy enterprises.

Advance in health management of dairy animals, metabolic diseases of highyielders- advances in preventive measures for production related diseases

#### UNIT 2: ADVANCES IN SHEEPAND GOAT PRODUCTION AND MANAGEMENT

Utility origin - Domestication - Numbers and distribution of meat and dualpurpose breeds - Methods of rearing - Range sheep production

The farm flock - Pure bred flock - Management during breeding season - Thesexual seasons and its control - Puberty - Time of the year to breed - Flushing- Ram-Ewe ratio.

Advances in feeding management, Nutrient deficiencies in range forage, Feed to supplement range forage, General feeding practices, Feeding materials, Lamb feeding, Use of antibiotics and hormones, Hand feeding, Self-feeding, Pellet feeding, Feeding lambs and ewes during lactation.

Recent development in sheep and goat management and their relevance under Indian economic conditions, needs and possibilities for future research.

Role of sheep husbandry in dry farming in India, Present development programmes in sheep and goat production, Advances in reproduction, housing, feeding and watering, diseases, Shearing methods and culling of sheep and goat.

Role of goat in animal agriculture, Goat farming in India, selection of Breeding stock, Breeding problems, Housing, Principles of feeding, Practices, Crops and crop residues for goats, Milking practices.

### **UNIT 3: ADVANCES IN POULTRY PRODUCTION MANAGEMENT**

Planning, organization, executive and management of poultry farms and hatcheries of various sizes - alternative in poultry production Demand, supply, present status of poultry production.

Problems and new management techniques in poultry for egg and meat in India. in other countries of the world, automation in poultry houses, management of specific pathogen free flocks.

Poultry development policies and planning for higher production constraints in development and solutions, Ethology and Entomology in relation to poultry production.

### **UNIT 4: ADVANCES IN FISHERIES MANAGEMENT**

Potential of inland water bodies with reference to respective state. Problems in the estimation of inland fish catch data. Fishing crafts and gears. Major riverine and estuarine systems of India. Major brackish water lakes and their fisheries. Fisheries of major reservoirs / natural lakes of India. Flood-plain capture fishery present status of their exploitation and future prospects.

Cold water fisheries of India. Aquaculture vs Agriculture. Systems of aquaculture - pond culture, pen culture, cage culture, running water culture and zero water exchange system, Major candidate species for aquaculture: freshwater, brackish-water and marine. Monoculture, polyculture and integrated

culture systems. Water and soil quality in relation to fish production. Physical, chemical and biological factors affecting productivity of ponds.

### **Practical**

Study of population trend and structure - Visit to cow and buffelo farms and critical analysis of various farm practices, Analysis of breeding, feeding, housing - Disease control management, management of young ones and maturing systems, Milking systems - yield management, Biosynthesis of milk, Post milk management techniques, Study of population trend and structure - Visit to sheep and goat farms and critical analysis of various farm practices, Analysis of breeding, feeding, housing - Disease control management, management of young ones and maturing systems Estimation of fibre diameter medullation percentage crimps, tensile strength, Grease, pH and moisture content of wool - Score card and grading of wool.

Planning and preparation of research and commercial projects on broiler and layer production management. Feed & Nutrient Management in poultry.

Analysis of species composition of commercial catches at landing and assembling centers, sampling and familiarization of commercially important groups.

Observations and experimental operations of selected fishing crafts and gears in inland / estuarine waters.

Visit to Dept. of fisheries, lakes and reservoirs, net making yards.

### **Suggested Readings**

Clarence HE . 2007. Dairy Cattle & Milk Production. Daya Publ. House.

Thomas CK & Sastry NSR. 1991. Dairy Bovine Production. Kalyani

Gupta JL. 2006. Sheep Production and Management. CBS.

Selected articles from journals on cow/buffalo/goat/sheep rearing & management

Freshwater fishery regions of the world and their major fish species composition. Global inland fish production data. Capture fishery resources of India.

Handbook of Fisheries and Aquaculture, ICAR

Aquaculture, by N Arumugam

Water & Soil Management Tips for Sustainable & Intensive Aquaculture: A  
Field Guide Bookby Subhendu Datta

Concept of Aquacultureby Akhil Abhishek

Handbook Of The Freshwater Fishes Of India. Giving The Characteristic  
Peculiarities of all the Species At Present Known, And Intended As A Guide  
To Students And District Officersby R Beavan

Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
4	MRS-CORE-1004	CORE	ADVANCE CONCEPTS IN DAIRY & FISHERIES EXTENSION	2 + 1	30 + 20 + 50 = 100

### Theory

**Unit 1 Dairy Extension:** History, need, definition, philosophy, principles, approaches and objectives of extension education. Present status of dairy and animal husbandry development programme launched in pre and post-independence era. Teaching and learning process, Extension Teaching Methods, classification and selection of teaching methods. Importance of Audio-Visual-Aids. Identification of rural leaders, their characteristics, role and function in rural development, training of rural leaders. Principle of working with group and their mobilisation. Need, principle and step of programme planning. Evaluation of extension programmes. Diffusion of innovations and categories of farmers. Problems of different stake holders, Conceptual orientation about different terms, like- RRA, PRA, IVLP/TAR, ATMA, ATIC, PTD, etc.

**Unit 2 Fisheries Extension :** Introduction to fisheries extension - concepts, objectives and principles; extension education, formal and informal education; History and role of fisheries extension in fisheries development. Fisheries extension methods- individual, group and mass contact methods and their effectiveness, factors influencing their selection and use; characteristics of technology, transfer of technology process; important TOT programs in fisheries; role of NGOs and SHGs in fisheries; Fisheries co-management; Adoption and diffusion of innovations, adoption and diffusion process, adopter categories and barriers in diffusion of fisheries innovations; Extension program planning and evaluation - steps and importance; participatory planning process. Basic concepts in rural sociology and psychology and their relevance in fisheries extension; social change, social control, social problems and conflicts in fisheries; gender issues in fisheries; theories of learning, learning experience, learning situation

### Practical

Acquiring skill in use of audio-visual and other aids: Hands-on training on use of LCD projector, PA system, camera. Skills in preparation of documents including script writing, Preparation and use of audio-visual aids including animation for dairy stakeholders Group discussion technique, Hands on learning of field problems in dairy and animal husbandry.

Collection of socio-economic data from fishing villages; study of social issues/problems through participatory and rapid rural appraisal techniques, stake holders analysis and needs assessment; assessment of development needs of community and role of formal and non-governmental organizations through stakeholder analysis; case studies on social/gender issues and social conflicts in fisheries. Case studies on extension programs and Success stories. Practical exercises on conducting fish farmers meet.

### Readings

Dairy Extension Strategies by Sheeraz Ahmad

Extension Education in Animal Husbandry, Dairy and Fisheries Sectors by S Murthy

Dairy Pasu Parbhandhan Hindi Edition

Freshwater Aquaculture by R. K. Rath

Fisheries Extension by Amita Saxena

Fisheries Extension and Administration by O. P. Sharma

Fish and Fisheries of India by V.G. Jhingram

A Text Book Of Fishery Science And Indian Fisheries by Dr C B L Srivastava

Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
4	MRS-CORE-1005	CORE	BLOCK PLACEMENT & FIELD REPORT	3	50 + 50 = 100

The student shall be placed for period of 1 month in any but not limited to any government / non-government / dairy / rural finance-bank / agricultural research / animal research / veterinary / environmental / medicinal/ ayurveda/food processing / architectural - landscaping - planning or similar organization closely related to the major subject opted by student.



The students are expected to gain work experience from block placement.

The student shall furnish a report of neatly typed 20-30 pages about the organizational setup, history-vision-mission and organizational structure, plans and programmes executed by the organization, tools and techniques and methodology used by the organization and the experience and learning and outcomes from block placement.

There shall be 50 internal marks and 50 external marks for block placement. The report shall carry 25 internal marks and 25 external marks. The viva shall carry 25 internal marks and 25 external marks.

<b>Semester</b>	<b>Paper Code</b>	<b>Paper Type</b>	<b>Subject Name</b>	<b>Credit</b>	<b>Marks Scheme</b>
4	MRS-CORE-1006	CORE	DISSERTATION & VIVA	6	100 + 100 =200

The student shall conduct action based activity but not limited to an experiment, a survey, a system development / planning, a case study or project proposal or an evolutionary study or similar research or experimental activity closely related to major subject of the choice.

The students are expected to report the above by submitting a neatly typed and bounded dissertation of 100-150 pages.

The tentative chapters shall be 1)Introduction 2)Literature Review 3)Modelling / System Setup 4) Observations / Outcomes 5)Summary & Conclusions. There shall be added annexures regarding data, references and other relevant details.

There shall be 100 internal marks and 100 external marks for dissertation. The dissertation shall carry 50 internal marks and 50 external marks. The viva shall carry 50 internal marks and 50 external marks.

<b>Semester</b>	<b>Paper Code</b>	<b>Paper Type</b>	<b>Subject Name</b>	<b>Credit</b>	<b>Marks Scheme</b>
4	MRS-MDC-1001	MULTI DISCIPLINARY	FARM BUSINESS MANAGEMENT, VALUE ADDITION & ENTERPRENIOUSHIP	2 + 1	30 + 20 + 50 = 100

## **Theory**

### **UNIT I**

Entrepreneurship - Concept, characteristics, Approaches, Theories, Need for enterprises development. Agri - entrepreneurship - Concept, characteristics, Nature and importance for sustainable Livelihoods. Traits of entrepreneurs - Risk taking, Leadership, Decision making, Planning, Organising, Coordinating and Marketing, Types of Entrepreneurs. Stages of establishing enterprise - Identification of sound enterprise, feasibility report, product selection, risk and market analysis, legal requirements. Project Management and Appraisal - Market, Technical, Financial, Social Appraisal of Projects.

### **UNIT II**

MSME enterprises - Profitable Agri enterprises in India - AgroProcessing, KVIC industries. Micro financing - meaning, Sources of Finance, Banks, Small scale industries development organizations. Marketing for enterprises - Concept, planning for marketing, target marketing, Competition, market survey and strategies, Product sales and promotion. Issues relating to success and failure of enterprises  
- Personal, Production, Finance, Social, Marketing.

### **UNIT III**

Management - Meaning, concept, nature and importance, Approaches to management, Levels of management, Qualities and skills of a manager.  
Extension Management - Meaning, Concept, Importance, Principles of management, Classification of Functions of Management.  
Planning - Concept, Nature, Importance, Types, Making planning effective.  
Decision making - Concept, Types of decisions, Styles and techniques of decision making,  
Organizing - Meaning of Organization, Concept, Principles, Organizational Structure, Span of Management, Departmentalization, Authority and responsibility, Delegation and decentralization, line and staff relations.

## **UNIT IV**

Coordination - Concept, Need, Types, Techniques of Coordination.  
Interpersonal relations in the organization.

Staffing - Need and importance, Manpower planning, Recruitment, Selection, Placement and Orientation, Training and Development -

Performance appraisal - Meaning, Concept, Methods.

Direction - Concept, Principles, Requirements of effective direction, Giving orders, Techniques of direction.

Leadership - Concept, Characteristics, Functions, Approaches to leadership, Leadership styles.

Organizational Communication - Concept, Process, Types, Net Works, Barriers to Communication.

Managing work motivation - Concept, Motivation and Performance, Approaches to motivation.

Supervision - Meaning, Responsibilities, Qualities and functions of supervision, Essentials of effective supervision.

Managerial Control - Nature, Process, Types, Techniques of Control, Budgeting, Observation, PERT and CPM, MIS.

## **UNIT V**

Post Harvest Management & Value addition in vegetables, flowers, fruits, spices, medicinal & aromatic and milk and dairy products

### **Practical**

Field visit to Successful enterprises-

Study of Characteristics of Successful entrepreneurs

Development of Project Proposal

Case Studies of Success / Failure enterprises

Exercise on Market Survey

Field visit to Financial institutions

Group exercise on development of short term and long term plan-

Simulated exercise on techniques of decision making

Designing organizational structure

Activity on leadership development skills.

### **Suggested Readings**

Gupta CB. 2001. Management Theory and Practice. Sultan Chand & Sons.  
Indu Grover. 2008. Handbook on Empowerment and Entrepreneurship.  
Agrotech Public Academy.

Khanka SS. 1999. Entrepreneurial Development. S. Chand & Co. Singh D.  
1995.

Effective Managerial Leadership. Deep & Deep Publ. Tripathi PC & Reddy PN.  
1991. Principles of Management. Tata McGraw Hill.

Vasanta Desai. 1997. Small Scale Industries and Entrepreneurship. Himalaya  
Publ. House.

Value Addition in Horticultural Crops by L. C. De

Value Addition and Quality Issues in Agriculture & Allied Areas by ADHIKARY  
M M

Value Additions in Flowers and Orchids by Lakshman Chandra De

Recent Trends in Good Agricultural and Collection Practices for Medicinal  
Plants with Special Focus on Identification and Value Addition by Central  
Council for Research in Ayurveda and Siddha

Arora JS. 2006. Introductory Ornamental Horticulture. Kalyani.

Bhattacharjee SK. 2006. Advances in Ornamental Horticulture. Vols. I-VI.  
Pointer Publ.

Bose TK & Yadav LP. 1989. Commercial Flowers. Naya Prokash.

Atal CK & Kapur BM. 1982. Cultivation and Utilization of Medicinal Plants. RRL, CSIR, Jammu.

Chadha KL Gupta. R. 1995. Advance in Horticulture. Vol. XI. Medicinal & Aromatic Plants. Malhotra Publ. House.

Dharamvir H. 2007. Bioactive Medicinal Plants. Gene Tech Books.

Farooqi AA, Khan MM & Vasundhara M. 2001. Production Technology of Medicinal and Aromatic Crops. Natural Remedies Pvt. Ltd.

Farooqi AA & Sriram AH. 2000. Cultivation Practices for Medicinal and Aromatic Crops. Orient Longman Publ.

Jain SK. 2000. Medicinal Plants. National Book Trust.

Khan IA & Khanum A. 2001 Role of Biotechnology in Medicinal and Aromatic Plants. Vol. IX. Vikaaz Publ.

Panda H. 2002. Medicinal Plants Cultivation and their Uses. Asia Pacific Business Press.

Prajapati ND, Purohit SS, Sharma AK & Kumar T. 2006. A Hand Book of Medicinal Plants. Agro Bios.

Ramawat KG & Merillon JM. 2003. BioTechnology - Secondary Metabolites. Oxford & IBH.

<b>Semester</b>	<b>Paper Code</b>	<b>Paper Type</b>	<b>Subject Name</b>	<b>Credit</b>	<b>Marks Scheme</b>
4	MRS-MDC-100	MULTIDISCIPLINARY	CONSERVATION & MANAGEMENT OF NATURAL RESOURCES	3	50 + 50 =100

## પર્યાવરણ અને કુદરતી સંપત્તિ

૧.૧ બ્રહ્માંડમાં પૃથ્વીનું સ્થાન અને પૃથ્વી પર રચાયેલ પર્યાવરણ

૧.૨ પર્યાવરણ અને કુદરતી સંપત્તિની ઓળખ

૧.૩ પર્યાવરણની સમજ

- ⇒ પર્યાવરણના સજીવ અને નિર્જીવ ઘટકો
- ⇒ પર્યાવરણની આવરણીય રચના અને તેના સિદ્ધાંતો
- ⇒ પર્યાવરણને સંતુલિત રાખતા વિવિધ પ્રકારના ઘટકક્રમો
- ⇒ નિવસનતંત્રમાં ઉર્જા પ્રવાહ અને આહાર શુંખલા
- ⇒ જીવ જગતની વિવિધતા
- ⇒ માનવ સર્જિત અને કુદરત સર્જિત પર્યાવરણ

૧.૪ પ્રદૂષણ

- ⇒ પ્રદૂષણની વ્યાખ્યા, સમજ, પ્રકારો અને કારણો
- ⇒ પર્યાવરણ અને પ્રદૂષણ વચ્ચેના સંબંધ
- ⇒ પર્યાવરણના તમામ ઘટકો ને પ્રદૂષણથી થતી અસર
- ⇒ તંદુરસ્ત અને નાતંદુરસ્ત પર્યાવરણની આર્થિક સામાજિક ભૌગોલિક રાજકીય તથા જૈવિક પ્રણાલીઓ પર થતી અસર

## કુદરતી સંપત્તિના મુખ્ય ઘટકો

૨.૧ જળ, જમીન, જંગલ, અવકાશ, પશુ, પંખી, તેનો નીચેના સંદર્ભે અભ્યાસ :

૨.૨ પર્યાવરણમાં તેના ઘટક તરીકે સ્થાન અને તેનું મહત્વ

૨.૩ પૃથ્વીમાં તેનું સ્થાન, પ્રમાણ, વહેંચણી, પ્રકારો, કાર્યો અને અગત્યતા

૨.૩ સજીવ, નિર્જીવ, ઘટકો સાથેનો અનિવાર્ય સહઅસ્તિત્વ

૨.૪ માનવ દ્વારા થતો વિવિધ ક્ષેત્રે ઉપયોગ

- ૨.૫ પ્રદૂષિત ઘટકોથી જીવિત પ્રણાલીઓ પર માઠી અસર
- ૨.૬ ઘટકોનું થતું અતિશોષણ અને પ્રદૂષિત થતા ઘટકો
- ૨.૭ પ્રદૂષિત ઘટકોની વિશ્વવિકરણ પર્યાવરણમાં થયેલ અસર
- ૨.૮ વિકાસના ઘટકોની ભૂમિકા
- ૨.૯ ઘટક ના પ્રદૂષિત થવાથી વધી રહેલા અનેક પ્રકારના કુદરતી પ્રકોપો
  - પૃથ્વી નું ગરમ થવું
  - તેજાબી વર્ષા
  - ઓઝોન સ્તર ક્ષીણ થવું
  - સુનામી
  - ધરતીકંપ
  - અતિવૃષ્ટિ
  - અનાવૃષ્ટિ
  - સમુદ્રની સપાટી વધવી
  - જીવ જગતની ઘટતી વિવિધતા

## ઉર્જા

- ૩.૧ ઉર્જાની ઓળખ , પ્રકાર, વ્યાખ્યા, સમજણ, અને અનિવાર્યતા
- ૩.૨ ઉર્જાના સ્વરૂપ , પ્રકાર, સ્ત્રોત, પરંપરાગત અને બિનપરંપરાગત ઉર્જા સ્ત્રોતોના લાભાલાભ.
- ૩.૩ સજીવ અને નિર્જીવ ઘટકોમાં ઉર્જા પ્રવાહ
- ૩.૪ પર્યાવરણની તંદુરસ્તી અને ઉર્જાનો સંબંધ
- ૩.૫ સ્થાયી વિકાસ અને પર્યાવરણની તંદુરસ્તીના સંદર્ભે ઉર્જાનો વપરાશ અને વિવિધ પર્યાવરણ ઉર્જા સ્ત્રોતની પસંદગીની વિચારણા

## કુદરતી સંપત્તિનું સંરક્ષણ અને સંવર્ધનની અનિવાર્યતા

- ૪.૧ કુદરતી સંપત્તિની આજની સ્થિતિ
- ૪.૨ કુદરતી સંપત્તિનું સંરક્ષણ અને સંવર્ધન ની અનિવાર્યતા
- ૪.૩ સ્થાનિક રાષ્ટ્રીય અને વૈશ્વિક સંદર્ભે કુદરતી સંપત્તિ નું જતન અને સંવર્ધન સંદર્ભે પરિવર્તન અડચણો અને માન્યતાઓ
- ૪.૪ કુદરતી સંપત્તિના જતન અને સંવર્ધન સાથે વિકાસની શક્યતાઓ



## કુદરતી સંપત્તિનું જતન અને સંવર્ધનનું વ્યવસ્થાપન

- ૫.૧ કુદરતી સંપત્તિના જતન અને સંવર્ધનના વ્યવસ્થાપનના અનિવાર્યતા
- ૫.૨ કુદરતી સંપત્તિના જતન અને સંવર્ધનના વ્યવસ્થાપન માટે ઉકોફેન્ડલી અભિગમ અને કુદરત સાથેની સંવાદી જીવન શૈલીની અનિવાર્યતા
- ૫.૩ જુદા જુદા લક્ષ્યજ્ઞથોને જાગૃત કરવા તેમના ગ્રહણ શક્તિ સંદર્ભે પ્રયોજવાના સમૂહ માધ્યમો
- ૫.૪ કુદરતી સંપત્તિના જતન અને સંવર્ધન ની વ્યવસ્થાપનમા લોકભાગીદારી ,સમાનતા, જેન્કર, વગેરે નું મહત્વ અમલીકરણ માટેની ઘટક વાર પદ્ધતિઓ અને કાર્યક્રમો
- ૫.૫ સ્થાયી વિકાસ અને આજીવિકા ઉપજ ના સંદર્ભે કુદરતી સંપત્તિનું જતન અને સંવર્ધનની સમજ
- ૫.૬ ગરીબી, ભૌતિક વિકાસ કુદરતી સંપત્તિના જતન અને સંવર્ધન અને અમલીકરણ વિષ્લેષણ આ ક્ષેત્રે કાર્યરત સંસ્થાઓ
- ૫.૭ કુદરતી સંપત્તિના જતન અને સંવર્ધન માટેના ઘડાયેલા સ્થાનિક રાષ્ટ્રીય અને આંતર રાષ્ટ્રીય કાયદાઓ અને નીતિઓ

## ફિલ્ડ વર્ક

- ગામ ની જેવવિવિધતા ની યાદી તૈયાર કરવી (પશુ , પખી, વનસ્પતિ વગેરે ...કોઈ એક ગામમાં)
- ગામમાં ક્ષેત્રે થયેલા જમીન અને જળ સરક્ષણ ના કામોની સમીક્ષા કરવી.
- ગામમાં સવ્ય્છતા ની સમીક્ષા કરવી
- ગામ ક્ષેત્રે ઉર્જા સ્ત્રોતો નો અભ્યાસ કરવો
- ગામ કક્ષાએ કુદરતી સંસાધનના વિકાસ માટેનું તમારું આયોજન (કોઈ એક સ્ત્રોત)

## સંદર્ભ ગ્રંથો

- ડૉ.મહેશ ત્રિવેદી (યુ.ગ્ર.નિ.બોર્ડ.અમદાવાદ) - માનવ અને પર્યાવરણ
- ડૉ .રમેશ ભાયાણી - પ્રદુષણ અને પર્યાવરણ
- મૃદુલા મહેતા - આપની લુંટાતીઘરતી
- સંકલન(ગજાનંદ પુસ્તકાલય સુરત) - પર્યાવરણ નો અભ્યાસ
- રમેશ સાવલીયા (સી.ઈ.ઈ. અમદાવાદ) - પર્યાવરણ સાથી
- સંકલન (ગજાનંદ પુસ્તકાલય સુરત) - પ્રદુષણ નો અજગર
- પી.સી.ત્રિવેદી(અવિસ્કાર. પબ્લિ. જયપુર) - પર્યાવરણ અધ્યન
- ડૉ.પુરોહિત (અજન્તા બુક્સ, બીકાનેર) - પર્યાવરણ શિક્ષા

Semester	Paper Code	Paper Type	Subject Name	Credit	Marks Scheme
4	MRS-FOU-1001	FOUNDATION	RURAL BUSINESS COMMUNICATION	0	100

- ૧.૧ મૌખિક સંદેશાવ્યવહાર, માહિતી સંચાર, પ્રત્યાયનની વ્યાખ્યા - સમજ તથા ઇતિહાસ
- ૧.૨ વ્યવસાયિક સંદેશાવ્યવહારનો અર્થ તથા હેતુઓ
- ૧.૩ માહિતી સંચારની પ્રક્રિયા / તત્વો
- ૧.૪ માહિતી સંચારનું મહત્વ
- ૧.૫ માહિતી સંચારના હેતુઓ / ધ્યેયો
- ૨.૧ સંદેશાવ્યવહારના સિધ્ધાંતો
- ૨.૨ સંદેશાવ્યવહારના જુદા-જુદા માધ્યમો
- ૨.૩ સંદેશાવ્યવહારની રીત /ભાત (પેટર્ન) જેવી કે વર્તુળ, ચેઇન, Y, X, યક વગેરે
- ૨.૪ માહિતી સંચારની તકો
- ૨.૫ માહિતી સંચારના લક્ષણો
- ૩.૧ માહિતી સંચારના પ્રકારો
- ૩.૨ અશબ્દિક માહિતી સંચાર -અર્થ, પ્રકારો /સ્વરૂપો ,ફાયદા -ગેરફાયદા
- ૩.૩ શબ્દિક માહિતી સંચારનો અર્થ,પ્રકારો
- ૩.૪ મૌખિક માહિતી સંચાર -અર્થ,ફાયદા -ગેરફાયદા
- ૪.૧ મૌખિક સંદેશાવ્યવહારના અગત્યના કૌશલ્યો જેવા કે સમિતિ/કમિટી , જુથચર્ચા/ ગ્રૂપ ડિસ્કશન, સંવાદ/ નેગોનીએશન - તેના લક્ષણ અને તત્વો
- ૪.૨ જાહેર વક્તવ્ય-તેના સિધ્ધાંતો , મીડિંગમાં ફાજરી આપવી તે વખતે ધ્યાનમાં રાખવાની બાબતો, સેમિનાર -ફાયદા -ગેરફાયદા

### લેખિત સંદેશાવ્યવહારના કૌશલ્યો.

- ૪.૩ મેમો/ચેતવણીપત્ર -તેના ફાયદા /ગેરફાયદા સરક્ષુલર /પરિપત્ર -તેના ફાયદા અને ગેરફાયદા
- ૪.૪ આવેદનપત્ર / અરજી / એપીલેશન તથા તેનું સ્વરૂપ , પૂછપરછ પત્ર / ઇન્કવારી લેટર , પ્રતિભાવ પત્ર / રીસપોન્સ લેટર
- ૪.૫ જુદા-જુદા પ્રકારના વ્યવહારિક પત્રો
- ૫.૧ વ્યવહારિક પત્રોમાં પાલન કરવા જેવી બાબતો /નિયમો
- ૫.૨ વ્યવહારિક પત્રોમાં ન કરવા જેવી બાબતો કે રાખવાની કાળજીઓ
- ૫.૩ માહિતી સંચારની પ્રક્રિયામાં આવતા અવરોધો
- ૫.૪ ઈન્ટરવ્યૂ / પ્રત્યક્ષ મુલાકાતનો અર્થ, ચોજવાના કારણો, ઈન્ટરવ્યૂ લેનાર વ્યક્તિની ખાસિયતો / લક્ષણો (ઈન્ટરવ્યૂ લેનાર વ્યક્તિમાં ખાસ કઈ બાબતો હોવી જોઈએ ?)
- ૫.૫ મૌખિક ઈન્ટરવ્યૂ માટે ધ્યાનમાં રાખવાની બાબતો

## ફિલ્ડ - વર્ક

૧. ગ્રામ સંદેશા વ્યવહારની રીતભાત જાણવી .
૨. ગ્રામ માહિતી સંચારણના વિવિધ માધ્યમોનો અભ્યાસ કરવો.
૩. ગ્રામ ધંધાકીય માહિતી સંચારણના પત્રો અને પરિપત્રોનો અભ્યાસ.
૪. ગ્રામ્ય સ્તરે સફળ ઉદ્યોગ સાહસિકની તુલ્ય મુલાકાત કરવી.
૫. ગ્રામ વ્યવસાયિક સમસ્યાના નિરાકારણ માટે યોજવામાં આવતા સભા -સંમેલનો -જૂથ ચર્ચા -સંવાદ નો પત્યક્ષ અનુભવ મેળવવો .

## સંદર્ભ ગ્રંથો

- **Rai & Rai** : **Business Communication**
- **Rogers & Shoemaker** : **Communications and Innovation**
- **David Berio** : **The Process of Communication**
- **Murphy** : **Effective Business Communication**