BHAKTA KAVI NARSINH MEHTA UNIVERSITY, JUNAGADH

FACULTY OF RURAL STUDIES

SYLLABUS FOR

M.R.S. SEMESTER -2

AS PER NEP 2020 (Effective from June-2026)

FACULTY OF RURAL STUDIES

BHAKATA KAVI NARSINH MEHTA UNIVERSITY – JUNAGADH

MRS PROGRAMME (HONOURS/RESEARCH) AS PER NEP – 2020, UGC GUIDELINES & SOP

MRS SEMESTER – 2

Sr. No.	Course Category	Subject Code	Course Name	INTERNAL	EXTERNAL	Total Marks	Credit (Th+Pra)	Total Credit
1	Discipline Specific Core **DSC - 4**		1. Agronomy	30	70	100	4+0	4
			2. Horticulture & Forestry	30	70	100	4+0	
			3. Animal Husbandry	30	70	100	4+0	
			4. Rural Extension	30	70	100	4+0	
2	Discipline Specific Core **DSC- 5**		1. Agronomy	30	70	100	4+0	4
			2. Horticulture & Forestry	30	70	100	4+0	
			3. Animal Husbandry	30	70	100	4+0	
			4. Rural Extension	30	70	100	4+0	
3	Discipline Specific Core **DSC- 6**		1. Agronomy	30	70	100	4+0	4
			2. Horticulture & Forestry	30	70	100	4+0	
			3. Animal Husbandry	30	70	100	4+0	
			4. Rural Extension	30	70	100	4+0	
4	Discipline Specific Elective **DSE- 3**		1. Agronomy	30	70	100	4+0	4
			2. Horticulture & Forestry	30	70	100	4+0	
			3. Animal Husbandry	30	70	100	4+0	
			4. Rural Extension	30	70	100	4+0	
			Rural Industrilization	30	70	100	4+0	
5	Discipline Specific Elective **DSE- 4**		1. Agronomy	30	70	100	4+0	4
			2. Horticulture & Forestry	30	70	100	4+0	
			3. Animal Husbandry	30	70	100	4+0	
			4. Rural Extension	30	70	100	4+0	
			Prakrutik Kheti (Natural Farming)	30	70	100	4+0	
6	Skill Enhancement Course **SEC - 2**		Concept of Social Reconstruction - 2	15	35	50	2+0	**2**
			Farm Pollution and Its Management	15	35	50	2+0	
								22

Note:THE SYLLABUS FORMRS SEMESTER -1 & 2 FOR HOUNORS DEGREE AND THEMRS SEMESTER -1 & 2 RESEARCH DEGREE IS SIMILAR AS GIVEN ABOVE.

Name of Course	Sem.	DSC/ DSE/ SEC/ OJT/ Dissertation / RP	Subject Code	Course Title	Credits	INTERNAL	EXTERNAL	Total Marks	EXTERNAL Duration
M.R.S.	2	DSC - 4		Agronomy	4+0	30	70	100	2.30 Hrs.

Title : Research Design in Agriculture

Course Objectives:

1. Students should know about the selection of site for experiments and uniformity trials
2. To aware the students about principles of experimental design
3. Students should be aware about the simple design of experiments
4. Students should know the methods and preparation of questionnaire.
5. The student should aware about to collect the sample, methods of sampling from the field and its analysis.

Course Outcomes:

Understand Research Fundamentals: Students will be able to understand the fundamental principles of scientific research and identify significant research problems within the agricultural sector.

Select Experimental Designs: Learners will be able to select and construct appropriate experimental designs, such as Randomized Block Design (RBD) or Latin Square Design (LSD), tailored to specific field conditions.

Apply Sampling Techniques: Students will demonstrate the ability to apply suitable sampling techniques and data collection methods to ensure accuracy in field and laboratory experiments.

Analyze Data: The course will enable students to perform statistical analysis using tools like ANOVA and regression to interpret agricultural data effectively.

Evaluate Results: Students will learn to critically evaluate experimental results and draw logical conclusions to address agricultural challenges.

Develop Research Reports: Finally, students will be capable of writing structured research proposals and technical reports to communicate their scientific findings clearly.

Course Content:

Unit:-1 Questionnaire: 20%

1.1 Definition and meaning of questionnaire

1.2 Characteristics of questionnaire

1.3 Merits of demerits of questionnaire

1.4 kinds of questionnaire

Unit:-2 Sampling and observations **20%**

2.1 What is sampling

2.2 Importance of sampling

2.3 Methods of sampling

2.4 observations & its importance

2.5 Importance observation taken during experimentation for major field crops

Unit:-3 Some important definitions used in field experiments design, objectives and types of field experiments, uniformity trial and principles of field experiments.20%

Unit:-4 Field experimental design: - **20%**

4.1 Aims and classification of experimental design and uniformity trials

4.2 Simple designs of experiments

4.3 Paired design of experiment

4.3.1 Completely Randomized Design

4.3.2 Randomized Block Design

4.3.3 Latin Square Design

Unit:-5 Care to be taken during field experiments **20%**

References:-

1. "Kshetra Prayog ni Karya Paddhati" (Gujarati Edition)
   - Dr. Ambalal Sendhabhai Patel & Shri Mahesh Ramnikbhai Vaishnav
2. Agricultural Statistics in India - P. C. Bansil
3 Field Experimental Designing. - Chandel R.S.
4. "Samajik Sansodhan Paddhatio" (Gujarati Edition) - A.G. shah & J.K. Dave
5. A Handbook of Rural Studies – Dr. K.R. Bharad

Name of Course	Sem.	DSC/ DSE/ SEC/ OJT/ Dissertation / RP	Subject Code	Course Title	Credits	INTERNAL	EXTERNAL	Total Marks	EXTERNAL Duration
M.R.S.	2	DSC - 4		Horticulture & Forestry	4+0	30	70	100	2.30 Hrs.

Title: High - Tech nursery Management

Course Objectives:

1 To understand modern Nursery Technology
2 To develop skill for Nursery Systems
3 To learn different Propagation Methods
4 To create self Employments

Course Outcomes

Ideally, this course transforms students into skilled professionals capable of managing nursery. students get job in government and privet field .

Course Content

Unit-1 Introduction to nursery management 20%

- Definition, importance,scope and types of nursery

Unit-2 Site selection and nursery planning 20%

- Criteria for site selection,layout planning,mother block, prpegation units,hardening units

Unit-3 Protected structure in high tech nursery 20%

- Types of structure,mist chembers,environment control

Unit-4 growing media and containers 20%

- Types of media,good cherecters of media,sterilizations and types of containers
- Showing ,planting, irrigation and plant protection in nursery

Unit-5 Plant protection measures in nursery 20%

- Insects and pest and its management
- Diseases and its management

Refrence:

1 Nursery management practices- by. P. K. Yadav
2 Fundamental of horticulture – by. J. B. Edmond
3 Protected cultivation of horticulture crops- by. T. K. bose

Name of Course	Sem.	DSC/ DSE/ SEC/ OJT/ Dissertation / RP	Subject Code	Course Title	Credits	INTERNAL	EXTERNAL	Total Marks	EXTERNAL Duration
M.R.S.	2	DSC - 4		Animal Husbandry	4+0	30	70	100	2.30 Hrs.

Title: Research & Biotechnology

Objectives:

1. To understand the meaning and uses of Biotechnology in general.
2. To understand latest techniques like multiple ovulation, embryo transfer, genetic engineering, cloning, test tube baby and transgenic animals and their uses.
3. To understand present and future implications of such techniques.
4. To know research and discovery, their types and uses.

Outcomes:

1. To get the meaning and uses of Biotechnology in general.
2. To get latest techniques like multiple ovulation, embryo transfer, genetic engineering, cloning, test tube baby and transgenic animals and their uses.
3. To get present and future implications of such techniques.
4. To get research and discovery, their types and uses.

Course Content

Unit: 1 What is biotechnology: its uses in domestic animals. Multiple ovulation and Embryo Transfer Technology: steps and their merits-demerits & genetic engineering.20%

Unit: 2 Transgenic animals: history and methods used and their uses. 20%

Unit: 3 Cloning: method and its uses, dolly shed produced by cloning. Test tube baby: method and uses. 20%

Unit: 4 What is research, its types and broad areas? 20%

Unit: 5 Discovery; types and uses. 20%

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 genetics and breeding – BAIF
4. The artificial insemination of farm animals – E.J. Perry.
5. Animal management: introduction animal science – James J. Kiser
6. Domestic animal – Harbans Singh
7. Dairying in India a review – D.N. Kharady

Faculty: - Rural Studies

Name of Course	Sem.	DSC/ DSE/ SEC/ OJT/ Dissertation / RP	Subject Code	Course Title	Credits	INTERNAL	EXTERNAL	Total Marks	EXTERNAL Duration
M.R.S.	2	DSC – 4		Rural Extension	4+0	30	70	100	2.30 Hrs.

Title : Rural Development - 2

Course Objectives

1) Explain the history of rural development and provide information on various programs.
2) Develop an understanding of the organizations working at the local level.
3) Provide information about various schemes for agricultural and animal husbandry development.

Course Outcomes:

1) Explain the history of rural development and get information on various programs.
2) Develop an understanding of the organizations working at the local level.
3) To get information about various schemes for agricultural and animal husbandry development.

Course Content

Unit 1	Economic Development and Economic Growth	(20%)
Unit 2	Economic Systems in Rural India	(20%)
Unit 3	Economic Activities through Community Development Programs	(20%)
Unit 4	Sustainable and Viable Development	(20%)
Unit 5	Government Approaches, Policies, and Programs for Rural Development	(20%)

References:

1) Rural Social Institutions of India (ભારતની ગ્રામીણ સામાજિક સંસ્થાઓ)
Author: Shah and Joshi (શાહ અને જોષી)
2) Agricultural Economics (કૃષિ અર્થશાસ્ત્ર) - Author: Mahesh Joshi (મહેશ જોષી)
3) Rural [Development] of India (ભારતનું ગ્રામીણ...) - Author: Babulal (બાબુલાલ)

Name of Course	Sem.	DSC/ DSE/ SEC/ OJT/ Dissertation / RP	Subject Code	Course Title	Credits	INTERNAL	EXTERNAL	Total Marks	EXTERNAL Duration
M.R.S.	2	DSC - 5		Agronomy	4+0	30	70	100	2.30 Hrs.

Title: - Crop Pest and Diseases - II

Objectives:-

1. To study the pest and disease damaged to field crops
2. To identify and to know control measures of different pest and diseases of the field crops
3. To know the nature of damage of insect and symptoms of diseases

Course Outcomes :-

1. To get the pest and disease damaged to field crops
2. To get and to know control measures of different pest and diseases of the field crops
3. To get the nature of damage of insect and symptoms of diseases

Course Content

Unit : 1. The concept of biological control of insect 10%

Unit : 2. Detailed marks of identification, host range, nature of damage of important field crops like. 20%

- Wheat
- Sugarcane
- Castor
- Rice
- Gram

Unit : 3 Detailed integrated insect management of important field crops like. 30%

- Wheat
- Sugarcane
- Castor
- Rice
- Gram

Unit : 4 Occurrence, economic importance, symptoms, favorable weather conditions of diseases of important field crop like. 20%

- Wheat
- Sugarcane
- Castor
- Rice
- Gram

Unit : 5 Detailed control measures of important field crop like. 20%

- Wheat
- Sugarcane
- Castor
- Rice
- Gram

Practical :

Field visit to study different insect damage and disease symptoms of above mentioned crops and dry preservation of insect damage parts of plant and damaged parts of plants by diseases.

References:

1. Principles and procedures of plant protection (Third edition) - S.B.Chattopadhyay
2. Biology of insect - S.C.Saxena
3. General Entomology (Third edition) - M.S. Mani
4. Sampurna pak sarakshan (Part-1) - Babubhai Avarani
5. Sampurna pak sarakshan (Part-2) - Babubhai Avarani
6. Introduction to Principles of Plant Pathology - R.S.Singh
7. Diseases of crop plants in India - G. Rangaswami
8. Plant Diseases (Sixth edition) - R.S.Singh

Name of Course	Sem.	DSC/ DSE/ SEC/ OJT/ Dissertation / RP	Subject Code	Course Title	Credits	INTERNAL	EXTERNAL	Total Marks	EXTERNAL Duration
M.R.S.	2	DSC – 5		Horticulture & Forestry	4+0	30	70	100	2.30 Hrs.

Title : Post Harvest Handing of horticulture crops

Objectives

1) Students learns how to enhans self life of crops
2) Learn how to minimise crop losses
3) Learn how to make value added products
4) Create self employments

Course Out comes

- **Identify maturity indices** to determine the optimal harvest time for different fruits, vegetables, and flowers.
- **Analyze the biological processes** driving deterioration, including respiration, transpiration, ethylene evolution, and senescence.
- **Evaluate post-harvest losses** by identifying mechanical, pathological, and physiological causes.
- **Implement handling techniques** such as proper sorting, grading, pre cooling, chemical treatments, and packaging
- **Design storage strategies** using appropriate temperature, humidity, and atmospheric controls (like modified or controlled atmosphere storage).
- **Apply value-addition methods** to process surplus produce into stable products like jams, jellies, pickles, and dehydrated goods.

Course Content

Unit-1 harvesting and fieldhandlings 20%

- Maturity indises
- Time of harvesting
- Methodofharvesting

Unit-2 post harvest treatments 20%

- Pre-cooling
- Cleaning and shorting
- Chemical treatments
- Waxing
- Hormones treatments
- Packing and handling

Unit-3 storage and cold chain management 20%

- Cold storage
- Control atmospheric storage
- Using refrigerated trucks for transportation

Unit-4 value addition of crops 20%

- drying/dehydretion
- Canning and bottling
- Minimal processing

Unit-5 value added products of horticulture crops 20%

- Jam ,catchup, potato vefar,mango pulp, amature powedar etc

Referance

1. FALPAKO (GUJRATI EDITION MARCH-2013) G,A,U, JUNAGADH
2. ADVANCE TECHNOLOGY IN HORTICULTURE----K.R. BHARAD
3 PLANT GROWTH REGULATION------K.R. BHARAD
4 HORTICULTURE A BASIC AWARENESS---BANDENDISTEL R. F.(1982)

Name of Course	Sem.	DSC/ DSE/ SEC/ OJT/ Dissertation / RP	Subject Code	Course Title	Credits	INTERNAL	EXTERNAL	Total Marks	EXTERNAL Duration
M.R.S.	2	DSC – 5		Animal Husbandry	4+0	30	70	100	2.30 Hrs.

Title : Animal Feeds and Nutrition

Course Objectives:

1. To learn importance of feed's and Nutrition.
2. To understand the concentrates.
3. To understand the Animal Nutrition.

Course Outcomes :

1. To get importance of feed's and Nutrition.
2. To get the concentrates.
3. To get the Animal Nutrition.

Course Content

Unit 1: Composition and classification of feed stuffs :- Roughages : Dry and Succulent. 20%

Unit 2: Concentrates:- Energy rich and protein rich:- Energy rich concentrates 20%

Unit 3: Protein rich concentrates : Plant, Animal & NPN feed stuffs. 20%

Unit 4: Unconventional Livestock feeds in India 20%

Unit 5: Nutrients of feeding stuffs and animal body : water, carbohydrates, protein, Lipids and minerals. Feed supplements and buy pass proteins. 20%

Suggested Readings / References:

1. Animal Feed (Practical) - Authors : B. M. Patel, N. S. Radadiya
2. Animal Feed - Authors : B. M. Patel, N. S. Radadiya
3. Animal Nutrition - Maynard & Loosli
4. Animal Nutrition – A.C. Chaudhary
5. Gaudarshan – Pashuposhan Visheshank

Name of Course	Sem.	DSC/ DSE/ SEC/ OJT/ Dissertation / RP	Subject Code	Course Title	Credits	INTERNAL	EXTERNAL	Total Marks	EXTERNAL Duration
M.R.S.	2	DSC – 5		Rural Extension	4+0	30	70	100	2.30 Hrs.

Title: Rural Development Programme

Course Objectives:

1. To increase awareness of Five-Year Plans in rural areas.
2. To enhance developmental programmes in tribal areas.
3. To obtain information about various ongoing schemes in rural areas.

Course Outcomes:

1. To get awareness of Five-Year Plans in rural areas.
2. To get developmental programmes in tribal areas.
3. To obtain information about various ongoing schemes in rural areas.

Course Content:

Unit 1: Schemes for the development of farmers in tribal areas and scheduled tribes. 20%

Unit 2: Schemes for water and land conservation. 20%

Unit 3: Schemes for the development of backward classes. 20%

Unit 4: Schemes for mechanization in agriculture. 20%

Unit 5: Approach, objectives, and achievements of the last Five-Year Plan concerning rural development. 20%

Suggested Readings / References:

1. Development and Environmental Economics — Dr. Mahesh Joshi
2. Rural Sociology - Dr. M. G. Shah / J. K. Dave
3. Agricultural Economics — Dr. Mahesh Joshi

Name of Course	Sem.	DSC/ DSE/ SEC/ OJT/ Dissertation / RP	Subject Code	Course Title	Credits	INTERNAL	EXTERNAL	Total Marks	EXTERNAL Duration
M.R.S.	2	DSC – 6		Agronomy	4+0	30	70	100	2.30 Hrs.

Title : Foundations of Sustainable Agriculture

Course Objectives

1. You will be study to create a plan for sustainable farming.
2. You will be study to evaluate the soil and water.
3. You will be study to implement IPM at a low cost.
4. You will be study to prepare a plan for a small agri - startup.

Course Learning Outcomes

1. You will be able to create a plan for sustainable farming.
2. You will be able to evaluate the soil and water.
3. You will be able to implement IPM at a low cost.
4. You will be able to prepare a plan for a small agri-startup.

Course Content:

Unit 1: Foundations of Sustainable Agriculture 20%

1.1 Definition of sustainable agriculture and 3 pillars: economic, social, environmental
1.2 Comparison of traditional vs chemical vs regenerative farming Agricultural
1.3 challenges of Gujarat: salinity, water scarcity, debt

Unit 2: Soil Health and Carbon Management 20%

2.1 Soil types, SOC - Soil Organic Carbon and its importance
2.2 Compost, vermicompost, jeevamrut,
2.3 Crop rotation, and cover crop.
2.4 Soil testing and parameters of carbon sequestration

Unit 3: Water Conservation and Climate Smart Techniques 20%

3.1 Rainwater harvesting, check dams, farm ponds
3.2 Drip, mulching, zero tillage, and conservation agriculture
3.3 Drought-tolerant crops and varieties
3.4 Weather-based farming advice and forecast

Unit 4: Agro ecology and Natural Crop Protection 20%

4.1 Principles of Agro ecosystem and Food Web - Understanding the farm's ecosystem and natural food chains.

4.2 IPM (Integrated Pest Management) - Biological control using friendly insects, pheromone traps, and neem-based formulations.

4.3 Conservation of Pollinators and Beneficial Insects

4.4 Conservation of Indigenous Seeds and Seed Banks

Unit 5: Market, Value Addition, and Rural Entrepreneurship 20%

5.1 Organic Certification - Understanding the certification processes for NPOP (National Programme for Organic Production) and PGS (Participatory Guarantee System).

5.2 FPO, Contract Farming, and Direct Marketing - Learning about Farmer Producer Organisations, corporate farming agreements, and direct-to-consumer sales.

5.3 Processing - Creating value-added products like pickles, powders, and other processed items from raw yields.

5.4 Government Schemes **-** Accessing benefits from PKVY (Paramparagat Krishi Vikas Yojana), NMSA (National Mission for Sustainable Agriculture), and agricultural subsidies.

Reference Books :-

1) "Sustainable Agriculture: Principles and Practices" by C. Thapa
2) "The One-Straw Revolution" by Masanobu Fukuoka

3) S.P.K. Book by – Subhash Palekar

4) "Package of Practices for Organic Farming" published by Anand Agricultural University (AAU) / Navsari Agricultural University (NAU)

5) "Operational Guidelines for PKVY and PGS-India" by the Ministry of Agriculture & Farmers Welfare, Government of India

Name of Course	Sem.	DSC/ DSE/ SEC/ OJT/ Dissertation / RP	Subject Code	Course Title	Credits	INTERNAL	EXTERNAL	Total Marks	EXTERNAL Duration
M.R.S.	2	DSC -6		Horticulture & Forestry	4+0	30	70	100	2.30 Hrs.

Title: Forest and Forest Management

Course Objectives

1. Students learns importance of forest
2. Learn how to minimise forest losses
3. Learn how to grow forest plants
4. To create self employments by nursery

Course Learning Outcomes

- **Resource Measurement:** Learn how to use special tools and math to measure tree height, trunk width, and overall forest size.
- **Sustainable Planning:** Discover how to plan harvests while ensuring new trees grow back, keeping the forest healthy for the future.
- **Ecosystem Protection:** Understand the role of forests in cleaning the air, storing carbon to fight climate change, and providing homes for wildlife.
- **Community Forestry:** Learn about teamwork between the government and local villages to protect and share the benefits of the woods

Course Content:

Unit-1 Introduction of Forest 20%

- Definition and types
- Forest function
- Status of forest

Unit-2 Silviculture and Forest Ecology 20%

- Silviculture systems
- Forest mensuration
- Tending forest operations

Unit–3 Forest Protection 20%

- Abiotic threats
- Biotic threats

Unit-4 Forest Policy and Laws 20%

- Forest policies
- Legislation
- Community involvement

Unit-5 Information about Important forest plants 20%

- Teac,bamboo,kher etc

Suggested Readings

1. FOREST IN INDIA ---V.P. AGRAVAL
2. Forest IN INDIA –A.P.DWIVEDI
3. A TEXTBOOK OF SILVICULTURE-------A.P. DWIVEDI
4. VAN CHETNA -DEPT OF FOREST GUJARAT

Name of Course	Sem.	DSC/ DSE/ SEC/ OJT/ Dissertation / RP	Subject Code	Course Title	Credits	INTERNAL	EXTERNAL	Total Marks	EXTERNAL Duration
M.R.S.	2	DSC – 6		Animal Husbandry	4+0	30	70	100	2.30 Hrs.

Title: Dairy Industry

Objective:

1. To Understand the importance of dairy industry.
2. To Know various dairy industry problems and how to overcome from them.
3. To know how one could help to village for preservation of milk and milk products.

Course Learning Outcomes

1. Explain the theoretical framework of rural industrialisation and its impact on the economy.
2. Classify different types of agro-based and cottage industries.
3. Evaluate the role of government agencies (like NABARD, KVK) in promoting rural industries.
4. Create strategies to overcome challenges related to marketing, finance, and technology in rural sectors.

Course Content:

Unit 1. Importance of dairy industry , Milk Production in the Gujarat & India : An overview Milk consumption & availability per capita 20%

Unit 2. Milk types and their specifications, Sources of Contamination of milk and control measures. 20%

Unit 3. Milk testing: society level and dairy level 20%

Unit 4. Storage of milk: method and advantages: Heating, chilling and by adding preservatives 20%

Unit 5. Diseases transmitted through milk and their preventive measures , Adulteration in milk and its test: Adulterants used and their testing methods. 20%

Suggested Readings

1. Rural Industrialisation in India – by B.K. Singh
2. Agro-Industrial Development in India – by S.N. Misra
3. Entrepreneurship Development – by S.S. Khanka

Name of Course	Sem.	DSC/ DSE/ SEC/ OJT/ Dissertation / RP	Subject Code	Course Title	Credits	INTERNAL	EXTERNAL	Total Marks	EXTERNAL Duration
M.R.S.	2	DSC – 6		Rural Extension	4+0	30	70	100	2.30 Hrs.

Title : Social Research - 2

Course Objectives

The primary objectives of this course are:

1. To identify social problems and gain information about them.
2. To develop a general understanding of social research.
3. To obtain information about the methodologies of social research.

Outcomes:

1. To get social problems and gain information about them.
2. To develop a general understanding of social research.
3. To obtain information about the methodologies of social research.

Course Content:

Unit 1: Use and Importance of library in research 20%

Unit 2: Observation method 20%

Unit 3: Questionnaire method 20%

Unit 4: Interview Method 20%

Unit 5: Data presentation and research report writing 20%

Recommended References

1. Rural Sociology and Rural Development - Akshaykumar Desai
2. Social Research - Dr. J. K. Shah and J. K. Dave

Name of Course	Sem.	DSC/ DSE/ SEC/ OJT/ Dissertation / RP	Subject Code	Course Title	Credits	INTERNAL	EXTERNAL	Total Marks	EXTERNAL Duration
M.R.S.	2	DSE- 3		Agronomy	4+0	30	70	100	2.30 Hrs.

Title: Research Design in Agriculture

Course Objectives:

1. Students should know about the selection of site for experiments and uniformity trials
2. To aware the students about principles of experimental design
3. Students should be aware about the simple design of experiments
4. Students should know the methods and preparation of questionnaire.
5. The student should aware about to collect the sample, methods of sampling from the field and its analysis.

Course Outcomes:

- Understand Research Fundamentals: Students will be able to understand the fundamental principles of scientific research and identify significant research problems within the agricultural sector.
- Select Experimental Designs: Learners will be able to select and construct appropriate experimental designs, such as Randomized Block Design (RBD) or Latin Square Design (LSD), tailored to specific field conditions.
- Apply Sampling Techniques: Students will demonstrate the ability to apply suitable sampling techniques and data collection methods to ensure accuracy in field and laboratory experiments.
- Analyze Data: The course will enable students to perform statistical analysis using tools like ANOVA and regression to interpret agricultural data effectively.
- Evaluate Results: Students will learn to critically evaluate experimental results and draw logical conclusions to address agricultural challenges.
- Develop Research Reports: Finally, students will be capable of writing structured research proposals and technical reports to communicate their scientific findings clearly.

Course Content:

Unit:-1 Questionnaire: - **20%**

1.1 Definition and meaning of questionnaire

1.2 Characteristics of questionnaire

1.3 Merits of demerits of questionnaire

1.4 kinds of questionnaire

Unit:-2 Sampling and observations **20%**

2.1 What is sampling

2.2 Importance of sampling

2.3 Methods of sampling

2.4 observations & its importance

2.5 Importance observation taken during experimentation for major field crops

Unit:-3 Some important definitions used in field experiments design, objectives and types of field experiments, uniformity trial and principles of field experiments.20%

Unit:-4 Field experimental design: - **20%**

4.1 Aims and classification of experimental design and uniformity trials

4.2 Simple designs of experiments

4.3 Paired design of experiment

4.3.1 Completely Randomized Design

4.3.2 Randomized Block Design

4.3.3 Latin Square Design

Unit:-5 Care to be taken during field experiments **20%**

References:-

1. “Kshetra Prayog ni Karya Paddhati” (Gujarati Edition)
   - Dr. Ambalal Sendhabhai Patel & Shri Mahesh Ramnikbhai Vaishnav
2. Agricultural Statistics in India
   - P.C.Bansil

3 Field Experimental Deisng.
   - Chandel R.S.

4. “Samajik Sansodhan Paddhatio” (Gujarati Edition)
   - A.G. shah & J.K. Dave

Name of Course	Sem.	DSC/ DSE/ SEC/ OJT/ Dissertation / RP	Subject Code	Course Title	Credits	INTERNAL	EXTERNAL	Total Marks	EXTERNAL Duration
M.R.S.	2	DSE – 3		Horticulture	4+0	30	70	100	2.30 Hrs.

Title: Production Technology of Vegetable crops

Course Objectives:

1. To understand the significance of vegetable farming and the categorization of different crops.
2. To learn about seedling production and modern farming techniques.
3. To study the cultivation practices of major summer and monsoon vegetables.
4. To study the cultivation practices of winter season and root vegetables.
5. To manage produce after harvest and understand sustainable farming.

Course Outcomes

1) Understand Importance and Classification (Basic Understanding)
Understand the importance and nutritional value of vegetables in the human diet.
Gain knowledge about the current status of vegetable production and export opportunities in India and Gujarat.
Classify different vegetables based on botanical traits and growing seasons.

2) Nursery Management and Propagation
Learn scientific methods to prepare healthy seedlings (e.g., Pro-tray method, Greenhouse nursery).
Implement modern seed treatment and sowing techniques.

3) Production Technology
Acquire knowledge of the entire cultivation process—from land preparation to harvesting—for various crops (Tomato, Brinjal, Chilli, Cauliflower, Cucurbits, etc.).
Plan Fertilizer Management and Irrigation Systems (Drip/Sprinkler).

4) Plant Protection and Weed Control
Identify major diseases and pests affecting vegetable crops.
Develop skills to protect crops using Integrated Pest Management (IPM) practices.

5) Harvesting and Post-Harvest Management
Determine the Maturity Indices of vegetables.

Course Content:

Unit 1: Introduction, Importance, and Classification 20%

1.1 Importance of Vegetables:

Nutritive value of vegetables in the human diet (Vitamins, Minerals, Fiber).
Vegetables as Protective food.,Economic importance and export potential.
Toxic and anti-nutrient compounds.
Current scenario and scope of the vegetable industry in India and the world.

1.2 Types of Vegetable Gardening:

Kitchen gardening (Home gardening)., Market gardening.,Truck gardening.,
Vegetable forcing (Off-season production).,Vegetable gardening for processing.
Vegetable garden for seed production.

1.3 Classification of Vegetables:

Botanical classification (Based on Families).
Classification based on hardiness (Cool season vs. Warm season crops).
Classification based on plant parts used (Root, Stem, Leaf, Flower, Fruit).

1.4 Factors Affecting Production:

Climatic factors: Temperature, Light (Photoperiodism), Humidity, and Rainfall.

1.5 Soil requirements: Soil types, pH, and fertility status for vegetable crops.

1.6 Plant Growth Regulators (PGRs):

Role of Auxins, Gibberellins, Cytokinins, and Ethylene in vegetable production.
Application for fruit setting, ripening, and controlling growth.

Unit 2: Nursery Management and Protected Cultivation 20%

- Nursery Management:
- Site selection and soil preparation for nursery beds.
- Seed treatment methods (Physical and Chemical).
- Sowing methods and aftercare of seedlings.
- Hi-Tech Nursery Technology:
- Use of Pro-trays and growing media (Cocopeat, Vermiculite, Perlite).
- Hardening of seedlings before transplanting.
- Protected Cultivation:
- Introduction to Greenhouses, Polyhouses, and Shade-net houses.
- Advantages of protected cultivation.

Unit 3: Production Technology of Fruit Vegetables (Solanaceous, Cucurbits & Okra) 20%

- (For each crop cover: Origin, Climate, Soil, Varieties, Sowing, Manures & Fertilizers, Irrigation, and Yield)
- Solanaceous Crops: Tomato, Brinjal (Eggplant), Chilli, and Capsicum.
- Cucurbits (Vine Crops): Cucumber, Bitter gourd, Bottle gourd, Ridge Gourd, Sponge Gourd, Little Gourd(Ivy gourd), Watermelon, and Muskmelon.
- Malvaceous Crops: Okra (Bhindi/Lady's Finger).
- Drumsticks , Curry Leaf.

Unit 4: Production Technology of Cole, Root, Bulb, and Leafy Crops 20%

- Cole Crops: Cabbage, Cauliflower, and Knol-khol.
- Root Crops: Carrot, Radish, and Beetroot.
- Bulb Crops: Onion and Garlic.
- Leguminous Crops: Garden Peas, Cowpea, Cluster bean and French beans.
- Leafy Vegetables: Spinach (Palak), Fenugreek (Methi), and Coriander.
- Tuber Crops: Potato and Sweet Potato.

Unit 5: Post-Harvest Management and Organic Farming 20%

Harvesting:

Maturity indices (Judging the right time to harvest).
Methods of harvesting.
Post-Harvest Handling:
Cleaning, Grading, Sorting, and Packaging.
Pre-cooling and Transportation.

Storage:

Principles of vegetable storage.
Cold storage and Low-cost storage structures (Zero Energy Cool Chamber).
Organic Vegetable Production:
Concept and importance of organic farming.
Use of Bio-fertilizers, Vermicompost, and Green manuring.
Basics of Organic Certification.

Marketing:

Supply chain channels and marketing challenges.
Export of processed vegetables.
Suggested Practical List (Laboratory/Field Work)

Identification of important vegetable seeds and plants.
Preparation of nursery beds and seed sowing.
Seed treatment methods.
Transplanting of vegetable seedlings.
Identification of major pests and diseases affecting vegetable crops.
Calculation of fertilizer doses for different crops.
Visit to a commercial vegetable farm, greenhouse, or vegetable market.

Textbooks & Reference Books

1. Vegetable Crops (Shakbhaji na Pako)
   Publisher: University Granth Nirman Board, Gujarat State.
2. Scientific Vegetable Farming (Vaigyanik Dhabe Shakbhaji ni Kheti)
   Publisher: Anand Agricultural University / Junagadh Agricultural University (Directorate of Extension Education).
3. Modern Vegetable Farming (Shakbhaji ni Aadhunik Kheti)
   Author: Dr. N. H. Patel and others.
4. Vegetable Crops (Vol. 1, 2 & 3)
   Author: T.K. Bose & M.G. Som
5. Textbook of Vegetables, Tuber Crops and Spices
   Author: S. Thamburaj & N. Singh
6. Vegetable Science (Olericulture)
   Author: D. Singh

Name of Course	Sem.	DSC/ DSE/ SEC/ OJT/ Dissertation / RP	Subject Code	Course Title	Credits	INTERNAL	EXTERNAL	Total Marks	EXTERNAL Duration
M.R.S.	2	DSE – 3		Animal Husbandry	4+0	30	70	100	2.30 Hrs.

Title: Animal Feeds and Nutrition

Objectives:

1. To know different feed stuffs and concentrates for dairy animals
2. To know the storage methods of fodders and roughages
3. To study nutritional supplements of cattle feed and their importance in animal health and productivity
4. To study ingredients of cattle feed and their importance in animal body and in feeds
5. To know the processing of inferior quality roughages and unconventional feeds

Outcomes:

1. Students get knowledge of animal nutrition for healthy and productive animals
2. Students acquire knowledge of nutrients of animal feeds and their role in animal body
3. Students get aware of feeding requirement of high yielding animals
4. Students get acquainted of importance of balanced ration
5. Students get skills of how to process inferior quality roughages especially in draught condition

Course Content:

Unit: 1 Feeding Stuff of Animals 20%

1.1 Composition and classification of feeding stuff: Roughages

Dry roughages, Hay making, Urea treatment

1.2 Classification of Succulent: cereals and leguminous fodders

Silage making: advantages and disadvantages, chemical processes

Unit: 2 Energy rich Concentrates 20%

2.1 Types of Energy Rich Concentrate: Cereal concentrates,

2.2 Molasses: types and uses, Industrial by-products, Edible roots, etc.

Unit: 3 Protein Rich Concentrates: 20%

3.1 Protein rich concentrate types: Concentrates of plant origin, Pulses, Plant By-products,Oil seed plants and by-products

3.2 Concentrates of Animal Origin: Meat and Bone meal, Fish meal, Milk powder, etc.

Unit: 4 Non-Conventional Animal Feeds 20%

4.1 Protein Rich Vegetable Sources: Subabul, Sharu, Shevari, Castor cake, Sunflower cake, Sesame cake, etc. Animal Protein Sources: Hatchery by-products, Liver meal, Fish meal, Frogs and frog meal, etc.

4.2 Energy Rich Sources: Fruit and Vegetable by-products, Other sources like: Molasses, Brewery waste, Rice bran, Oilseed hulls and husks, Bypass fat, etc.

Unit: 5 Nutrients of Feeding Stuff and Animal Body 20%

5.1 Nutrients of Feeding Stuff: Water, Carbohydrates, Proteins, Lipids and Minerals

5.2 Feed Supplement, By-pass Proteins and By-pass fat.

Reference Books:

1. પશુ આહાર – બી.એમ. પટેલ અને એન.એસ. રાદડીયા, યુનીવર્સીટી ગ્રંથ નિર્માણ બોર્ડ, અમદાવાદ

2. પશુ આહાર (પ્રાયોગિક) બી.એમ. પટેલ અને એન.એસ. રાદડીયા, યુનીવર્સીટી ગ્રંથ નિર્માણ બોર્ડ, અમદાવાદ

૩. ગૌદર્શન માસિક અંક – પશુપાલાન ખાતું, ગુ. રા. ગાંધીનગર

4. A Text Book of Animal Husbandry by G. C. Banerjie,
5. A Hand Book of Animal Husbandry by ICAR,
6. Animal Management: Introduction to animal Science by James J. Kiser

Name of Course	Sem.	DSC/ DSE/ SEC/ OJT/ Dissertation / RP	Subject Code	Course Title	Credits	INTERNAL	EXTERNAL	Total Marks	EXTERNAL Duration
M.R.S.	2	DSE – 3		Rural Extension	4+0	30	70	100	2.30 Hrs.

Title : Rural Development - 2

Course Objectives

1) Explain the history of rural development and provide information on various programs.
2) Develop an understanding of the organizations working at the local level.
3) Provide information about various schemes for agricultural and animal husbandry development.

Course Outcomes:

1) Explain the history of rural development and get information on various programs.
2) Develop an understanding of the organizations working at the local level.
3) To get information about various schemes for agricultural and animal husbandry development.

Course Content:

Unit 1 Economic Development and Economic Growth (20%)

Unit 2. Economic Systems in Rural India (20%)

Unit 3 Economic Activities through Community Development Programs (20%)

Unit 4 Sustainable and Viable Development (20%)

Unit 5 Government Approaches, Policies, and Programs for Rural Development (20%)

References:

1) Rural Social Institutions of India (ભારતની ગ્રામીણ સામાજિક સંસ્થાઓ)

Author: Shah and Joshi (શાહ અને જોષી)

2) Agricultural Economics (કૃષિ અર્થશાસ્ત્ર)

Author: Mahesh Joshi (મહેશ જોષી)

3) Rural [Development] of India (ભારતનું ગ્રામીણ...)

Author: Babulal (બાબુલાલ)

Name of Course	Sem.	DSC/ DSE/ SEC/ OJT/ Dissertation / RP	Subject Code	Course Title	Credits	INTERNAL	EXTERNAL	Total Marks	EXTERNAL Duration
M.R.S.	2	DSE – 3		Rural Industrilization	4+0	30	70	100	2.30Hrs.

Title: Rural Industrialisation

Course Objectives

1. To understand the interdependence between agriculture and industry in the context of rural development.
2. To analyze the role of agro-based industries in employment generation and poverty alleviation.
3. To study the various policies and institutional support systems available for rural industrialisation.
4. To identify the challenges faced by rural entrepreneurs and agro-industries.

Course Learning Outcomes

1. Explain the theoretical framework of rural industrialisation and its impact on the economy.
2. Classify different types of agro-based and cottage industries.
3. Evaluate the role of government agencies (like NABARD, KVIC) in promoting rural industries.
4. Create strategies to overcome challenges related to marketing, finance, and technology in rural sectors.

Course Content:

Unit 1: Introduction to Rural Industrialisation 20%

1.1 Concept & Meaning: Definition of Rural Industrialisation, Need and Importance.
1.2 Agriculture-Industry Linkage: Interdependence (Forward and Backward linkages).
1.3 Role in Economic Development: Contribution to GDP, Employment Generation, and checking migration from rural to urban areas.
1.4 Gandhian Approach: Mahatma Gandhi's view on Gram Swaraj and Cottage Industries.

Unit 2: Classification of Rural and Agro-Industries 20%

2.1 Agro-Based Industries: Food Processing (Dairy, Sugar, Fruit Pulp), Textile (Cotton, Silk, Jute), and Oilseeds.

2.2 Non-Agro Based Industries: Handicrafts, Handlooms, Sericulture, and Khadi & Village Industries (KVIC).

2.3 Forest-Based Industries: Paper, Timber, and Minor Forest Produce.

2.4 MSMEs: Definition of Micro, Small, and Medium Enterprises and their significance in the rural context.

Unit 3: Institutional Support and Finance 20%

3.1 Financial Institutions: Role of NABARD (National Bank for Agriculture and Rural Development), SIDBI, Regional Rural Banks (RRBs), and Cooperative Banks.

3.2 Government Schemes: PMEGP (Prime Minister's Employment Generation Programme), ASPIRE (Scheme for Promotion of Innovation, Rural Industries and Entrepreneurship), and SFURTI.

3.3 Microfinance: Concept of Self Help Groups (SHGs) and Microfinance Institutions in rural industrialisation.

Unit 4: Entrepreneurship and Infrastructure 20%

4.1 Rural Entrepreneurship: Characteristics, Needs, and Types of Rural Entrepreneurs.

4.2 Infrastructure Requirements: Energy/Power supply, Transportation, Storage & Warehousing (Cold Chains), and Communication.

4.3 Marketing Strategy: Problems of marketing rural products, Cooperative Marketing, and the role of E-NAM (National Agriculture Market).

Unit 5: Challenges and Future Prospects 20%

5.1 Major Challenges: Raw material availability, Lack of technical know-how, Low-quality standards, and Competition from large-scale industries/MNCs.

5.2 Globalization Impact: WTO regulations and their impact on Indian rural industries.

5.3 Emerging Trends: Organic Farming based industries, Agri-Startups, Contract Farming, and Value Addition.

5.4 Case Studies: Success stories of Amul (Dairy) or Lijjat Papad (Cooperative model).

Suggested Readings

1. Rural Industrialisation in India – by B.K. Singh
2. Agro-Industrial Development in India – by S.N. Misra
3. Entrepreneurship Development – by S.S. Khanka

Name of Course	Sem.	DSC/ DSE/ SEC/ OJT/ Dissertation / RP	Subject Code	Course Title	Credits	INTERNAL	EXTERNAL	Total Marks	EXTERNAL Duration
M.R.S.	2	DSE – 4		Agronomy	4+0	30	70	100	2.30 Hrs.

Title: Prakrutik Kheti (Natural Farming)

Course Objectives

1. To introduce the philosophy and historical evolution of Prakrutik Kheti in India.
2. To provide technical knowledge on the four pillars of Natural Farming (Beejamrit, Jeevamrit, Acchadana, and Whapasa).
3. To understand soil health as a living entity and the role of the soil microbiome.
4. To equip students with ecological pest and disease management skills without synthetic chemicals.
5. To explore the economic sustainability and marketing potential of natural produce.

Course Outcomes

1. Explain the ecological and economic benefits of transitioning from chemical to natural farming.
2. Prepare on-farm bio-inputs like Beejamrit and Jeevamrit independently.
3. Design a multi-cropping farm model that ensures year-round income and soil cover.
4. Diagnose pest issues and apply appropriate natural decoctions for management.
5. Apply for PGS certification and develop a marketing strategy for "Chemical-Free" products.

Course Content:

Unit 1: Philosophy and Principles of Natural Farming 20%

1.1 History & Evolution:- Traditional Indian agriculture vs. Green Revolution impacts; contribution of pioneers like Masanobu Fukuoka and Subhash Palekar.

1.2 Core Concepts:- Definition of Prakrutik Kheti; difference between Organic Farming and Natural Farming.

1.3 The Ecosystem Approach:- Relationship between soil, plants, animals, and humans; principles of Panchamahabhuta (Earth, Water, Fire, Air, Ether) in agriculture.

Unit 2: The Four Pillars of Prakrutik Kheti **20%**

2.1 Beejamrit (Seed Treatment):- Importance of microbial coating of seeds; preparation and application.

2.2 Jeevamrit (Microbial Culture):- Role of indigenous cow dung and urine; preparation of liquid and solid (Ghan-Jeevamrit) formulations; mechanisms of nutrient mobilization.

2.3 Acchadana (Mulching):- Types of mulching (Soil, Straw, and Live mulching); role in moisture retention and weed suppression.

2.4 Whapasa (Moisture-Air Balance):- Understanding soil aeration; water management through the Whapasa condition.

Unit 3: Soil Health and Nutrient Management **20%**

3.1 Living Soil:- Understanding the soil microbiome, earthworms, and mycorrhizae.

3.2 Nutrient Cycling:- Role of leguminous crops and pulse integration; nitrogen fixation and green manuring.

3.3 Liquid Bio-inputs:- Preparation of Saptadhanyankur ark (seven-grain sprout extract) and other liquid manures.

Unit 4: Ecological Plant Protection **20%**

4.1 Preventative Measures:- Light traps, yellow sticky traps, and bird perches.

4.2 Natural Formulations:- Preparation and use of Neemastra, Agniastra, Brahmastra, and Dashparni Ark.

4.3 Disease Management:- Use of sour buttermilk (Saur Chhash) and ginger-garlic extracts; promoting beneficial predatory insects.

Unit 5: Farming Systems and Economic Sustainability **20%**

5.1 Cropping Models:- Multi-cropping, intercropping, and border cropping systems; 5-tier horticulture models.

5.2 Livestock Integration:- The central role of the Indian Desi Cow in the farming system.

5.3 Economics & Certification:- Cost-benefit analysis (Input cost reduction); Participatory Guarantee System (PGS) for certification; marketing of natural produce and Farmer Producer Organizations (FPOs).

References

1. NITI Aayog (2026). Training Manual: Empowering Farmers through Natural Farming Best Practices.

2. ICAR (Indian Council of Agricultural Research). Syllabus for Undergraduate Programme: Natural Farming.

3. Fukuoka, M. The One-Straw Revolution: An Introduction to Natural Farming.

4. Palekar, S. The Philosophy of Prophetic Nature Farming.

5. National Centre for Organic and Natural Farming (NCONF). Technical Manual on Bio-input Preparations.

Name of Course	Sem.	DSC/ DSE/ SEC/ OJT/ Dissertation / RP	Subject Code	Course Title	Credits	INTERNAL	EXTERNAL	Total Marks	EXTERNAL Duration
M.R.S.	2	DSE - 4		Animal Husbandry	4+0	30	70	100	2.30 Hrs.

Title: Research & Biotechnology

Objectives:

1. To understand the meaning and uses of Biotechnology in general.
2. To understand latest techniques like multiple ovulation, embryo transfer, genetic engineering, cloning, test tube baby and transgenic animals and their uses.
3. To understand present and future implications of such techniques.
4. To know research and discovery, their types and uses.

Outcomes:

1. To get the meaning and uses of Biotechnology in general.
2. To get latest techniques like multiple ovulation, embryo transfer, genetic engineering, cloning, test tube baby and transgenic animals and their uses.
3. To get present and future implications of such techniques.
4. To get research and discovery, their types and uses.

Course Content

Unit: 1 What is biotechnology: its uses in domestic animals. Multiple ovulation and Embryo Transfer Technology: steps and their merits-demerits & genetic engineering.20%

Unit: 2 Transgenic animals: history and methods used and their uses. 20%

Unit: 3 Cloning: method and its uses, dolly shed produced by cloning. Test tube baby: method and uses. 20%

Unit: 4 What is research, its types and broad areas? 20%

Unit: 5 Discovery; types and uses. 20%

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 genetics and breeding – BAIF
4. The artificial insemination of farm animals – E.J. Perry.
5. Animal management: introduction animal science – James J. Kiser
6. Domestic animal – Harbans Singh
7. Dairying in India a review – D.N. Kharady

Name of Course	Sem.	DSC/ DSE/ SEC/ OJT/ Dissertation / RP	Subject Code	Course Title	Credits	INTERNAL	EXTERNAL	Total Marks	EXTERNAL Duration
M.R.S.	2	DSE - 4		Horticulture & Forestry	4+0	30	70	100	2.30 Hrs.

Title: High - Tech nursery Management

Course Objectives:

1. To understand modern Nursery Technology
2. To develop skill for Nursery Systems
3. To learn different Propagation Methods
4. To create self Employments

Course Outcomes

Ideally, this course transforms students into skilled professionals capable of managing nursery. students get job in government and privet field.

Course Content

Unit-1 Introduction to nursery management 20%

- Definition, importance,scope and types of nursery

Unit-2 Site selection and nursery planning 20%

- Criteria for site selection,layout planning,mother block, prpegation units,hardening units

Unit-3 Protected structure in high tech nursery 20%

- Types of structure,mist chembers,environment control

Unit-4 growing media and containers 20%

- Types of media,good cherecters of media,sterilizations and types of containers
- Showing ,planting, irrigation and plant protection in nursery

Unit-5 Plant protection measures in nursery 20%

- Insects and pest and its management
- Diseases and its management

Refrence:

1) Nursery management practices- by. P. K. Yadav
2) Fundamental of horticulture – by. J. B. Edmond
3) Protected cultivation of horticulture crops- by. T. K. bose

Name of Course	Sem.	DSC/ DSE/ SEC/ OJT/ Dissertation / RP	Subject Code	Course Title	Credits	INTERNAL	EXTERNAL	Total Marks	EXTERNAL Duration
M.R.S.	2	DSE - 4		Rural Extension	4+0	30	70	100	2.30 Hrs.

Title: Rural Development Programme

Course Objectives:

1. To increase awareness of Five-Year Plans in rural areas.
2. To enhance developmental programmes in tribal areas.
3. To obtain information about various ongoing schemes in rural areas.

Course Outcomes:

1. To get awareness of Five-Year Plans in rural areas.
2. To get developmental programmes in tribal areas.
3. To obtain information about various ongoing schemes in rural areas.

Course Content:

Unit 1: Schemes for the development of farmers in tribal areas and scheduled tribes. 20%

Unit 2: Schemes for water and land conservation. 20%

Unit 3: Schemes for the development of backward classes. 20%

Unit 4: Schemes for mechanization in agriculture. 20%

Unit 5: Approach, objectives, and achievements of the last Five-Year Plan concerning rural development. 20%

Suggested Readings / References:

1. Development and Environmental Economics — Dr. Mahesh Joshi
2. Rural Sociology - Dr. M. G. Shah / J. K. Dave
3. Agricultural Economics — Dr. Mahesh Joshi

Name of Course	Sem.	DSC/ DSE/ SEC/ OJT/ Dissertation / RP	Subject Code	Course Title	Credits	INTERNAL	EXTERNAL	Total Marks	EXTERNAL Duration
M.R.S.	2	DSE – 4		Research Methodology	4+0	30	70	100	2.30 Hrs.

Title :- Research Methodology

Course Objectives:

1 To develop a scientific attitude in students by using research techniques.
2 To understand the relationship between research and science.
3 To understand the place and importance of research in the social field.
4 To learn about true knowledge through research.

Course Outcomes

1: Demonstrate Scientific Temperament- Apply research techniques to develop a scientific attitude and logical reasoning in problem-solving.
2: Analyze the Relationship between Science and Research- Explain the meaning, definitions, and characteristics of science and its fundamental link to the research process.
3: Evaluate the Significance of Social Research- Identify the place, importance, and specific objectives of research within the social sciences field.
4: Classify and Source Data- Distinguish between primary and secondary data and identify various field sources for data collection.
5: Implement Data Collection Methods- Utilize observation, questionnaires, and interview techniques while understanding their specific characteristics and limitations.
6: Execute Data Presentation- Organize research findings through effective tabulation and pictorial representations/diagrams.
7: Formulate Research Reports- Draft comprehensive research reports, articles, and summaries using appropriate writing styles tailored to specific audiences.

Course Content:

Unit 1 Meaning, definition, and characteristics of science. (20%)

- Importance, meaning, and types of 'Universe' (Population) in research.

Unit 2 Importance and objectives of social research. (20%)

Unit 3 Importance of data in research: Meaning and types. (20%)

* Secondary data and Primary data: Their sources.

* Meaning and importance of field sources.

Unit 4 Methods of data collection in research:Observation, Questionnaire, Interview (20%)

* Meaning, utility, types, characteristics, and limitations of each method.

Unit 5 Presentation of Data in Research &Report Writing in Research (20%)

(A) Presentation of Data in Research:

1. Tabulation:- Meaning, types, and importance.
2. Diagrams:- Pictorial representation, its importance, and types.

(B) Report Writing in Research:

1. Meaning, importance, readership, and writing style.
2. Research articles and summary reports.

Reference

1. Social Research Methods – Dr. Arvind Desai
2. Research Methods – Dr. Dave
3. Research Methods in Sociology – Prof. A.G. Shah
4. Research System – Dr. Vijay Harare
5. Research Design – Dr. Vimal Shah
6. Research Report – Dr. Vimal Shah
7. Research Methods and Procedures – Dr. Haribhai Desai

Name of Course	Sem.	DSC/ DSE/ SEC/ OJT/ Dissertation / RP	Subject Code	Course Title	Credits	INTERNAL	EXTERNAL	Total Marks	SEE Duration
M.R.S.	2	SEC- 2		Farm Pollution and Its Management	2+0	15	35	50	1 Hrs.

Title: Farm Pollution and Its Management

Course Objectives

The primary objective of this course is to provide students with a comprehensive understanding of the sources, impacts, and mitigation strategies of pollution arising from agricultural activities. Specifically, the course aims to:

1. To identify various sources of pollution in the agricultural sector, including chemical, organic, and mechanical sources.
2. To understand the impact of farm pollution on soil health, water quality, and the surrounding ecosystem.
3. To learn sustainable management practices and modern technologies to minimize waste and pollution on the farm.
4. To familiarize students with legal regulations and environmental standards related to agricultural waste management.

Course Outcomes

1: Differentiate between point and non-point sources of farm pollution.
2: Assess the environmental risks associated with the excessive use of fertilizers and pesticides.
3: Develop a comprehensive waste management plan for animal husbandry and crop residues.
4: Implement "Good Agricultural Practices" (GAP) to ensure long-term sustainability and food safety.

Course Content:

Unit 1: Introduction to Farm Pollution 20%

1.1 Definition and scope of farm pollution.

1.2 Types of pollutants: Agrochemicals, livestock waste, plastic mulch, and greenhouse gases.

1.3 Global and local environmental challenges in modern agriculture.

Unit 2: Agrochemical , Soil and Water Pollution and Management 40%

2.1 Fertilizers:* Nutrient leaching, eutrophication of water bodies, and soil acidification.

2.2 Pesticides:* Chemical runoff, bioaccumulation in the food chain, and effect on non-target organisms.

2.3 Management:* Integrated Nutrient Management (INM) and Integrated Pest Management (IPM).

2.4 Soil erosion and sediment transport.

2.5 Salinity and heavy metal accumulation in agricultural land.

2.6 Management: Soil conservation methods, drip irrigation, and phytoremediation.

Unit 3: Livestock, Organic Waste, Crop Residue and Plastic Management 40%

3.1 Pollution from animal manures and odors.

3.2 Methane emissions from enteric fermentation and waste storage.

3.3 Management: Composting techniques, biogas production, and vermicomposting.

3.4 Impact of stubble burning on air quality.

3.5 Plastic pollution from greenhouses and mulching.

3.6 Management: In-situ and ex-situ residue management (mulching, baling, bio-ethanol production).

References

1. "Environmental Pollution and Agriculture" by S.A. Abbasi and M. Kirmani.
2. "Agricultural Waste Management: Field Handbook" by USDA Natural Resources Conservation Service.
3. "Principles of Environmental Science" by William Cunningham and Mary Cunningham.
4. "Agrochemicals and the Environment" by R.E. Hester and R.M. Harrison.
5. "Soil and Water Conservation Engineering" by Rodney L. Huffman.

Name of Course	Sem.	DSC/ DSE/ SEC/ OJT/ Dissertation / RP	Subject Code	Course Title	Credits	INTERNAL	EXTERNAL	Total Marks	SEE Duration
M.R.S.	2	SEC-2		Concept of Social Reconstruction - 2	2+0	15	35	50	1 Hrs.

Title: Concept of Social Reconstruction - 2

Course Objectives:

1. Students acquire knowledge about social reconstruction.
2. Students get an introduction to national philosophical thinking
3. Students become familiar with various revolutions.

Course Outcomes:

1. Cultivate the understanding that human life flows continuously through all times.
2. Cultivate the understanding that wear and tear and renewal are part of life, and embrace them.
3. Learn how to find a way through difficult situations by drawing inspiration from various revolutions and the lives of great figures.

Course Content:

Unit 1: Attempts to bring about social revolution through the power/rule of Napoleon Bonaparte, George Washington, Joseph Stalin, Lenin, etc. 40%

Unit 2: World War II, its theoretical structure as part of the revolutionary process, positive impacts on society, and an introduction to Hitler and Mussolini. 40%

Unit 3: Revolutions that occurred as a part of social reconstruction: 20%

3.1 Causes and effects of the American Revolution

3.2 Causes and effects of the Russian Revolution

References

1. History of the World – Dr. G. Dharaiya.
2. History of Political Theory – George Sabine.
3. Western Philosophy / Thinkers – Harisiddhbhai M. Joshi
4. Historical Tales of Greece – Part – 1 & 2 Darshak
5. Socrates – Darshak

Curriculum and Credit Framework for Postgraduate Studies in English

(Effective from Academic Year 2026-2027)

Structure of the External Question Paper

Q. No.	Question Type	Units Covered	Set	Marks Each	Total Marks
1	Long Answer / Essay Type	Unit 1	A or B	14	14
2	Long Answer / Essay Type	Unit 2	A or B	14	14
3	Long Answer / Essay Type	Unit 3	A or B	14	14
4	Long Answer / Essay Type	Unit 4	A or B	14	14
5	Short Notes or Short Answer Questions	All Units	Short Notes: 2 out of 4 OR Short Questions: 7 out of 10	7 (short note) / 2 (short question)	14
				TOTAL	**70**

Internal Assessment Scheme

Sr. No.	Evaluation Component	4-Credit Subjects (Marks)	2-Credit Subjects (Marks)
1	Assignments, seminars, quizzes, mid-term tests, lab records, presentations, Term Paper, Viva-voce, Projects/Surveys/Field visits, Journal Writing (Any three - 5 marks each for 4-credit; any one - 5 marks for 2-credit)	15	05
2	Mid-Term Evaluation	15	10
	TOTAL	**30**	**15**