

SCHEME & SYLLABUS
M.Sc-Agronomy



Dept. of Natural Sciences
UISH
Sant Baba Bhag Singh University
2017

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M. Sc Agronomy scheme

I. Theory Subjects

SEMESTER-I						
Sr. No.	Subject Code	Subject Name	Contact Hours (L:T:P)	Credits (L:T:P)	Total Contact Hours	Total Credit Hours
1	AGR525	Modern concepts in crop production	3:0:0	3:0:0	3	3
2	AGR527	Principles and practices of soil Fertility and nutrient management	2:0:0	2:0:0	2	2
3	AGR531	Agronomy of major cereals and pulses	3:0:0	3:0:0	3	3
4	AGR511	Genetics of crop plants	2:0:0	2:0:0	2	2
5	MAT513	Statistical methods and experimental designs	2:0:0	2:0:0	2	2
6	AGR533	Dryland farming and watershed Management	2:0:0	2:0:0	2	2

II. Practical Subjects

1	AGR529	Principles and practices of soil Fertility and nutrient management Lab	0:0:2	0:0:1	2	1
2	AGR539	Agronomy of major cereals And pulses Lab	0:0:2	0:0:1	2	1
3	LIS501	Library and information services	0:0:2	0:0:1	2	1
4	AGR517	Basic concept in laboratory Techniques Lab	0:0:2	0:0:1	2	1

Total Contact hrs: 22

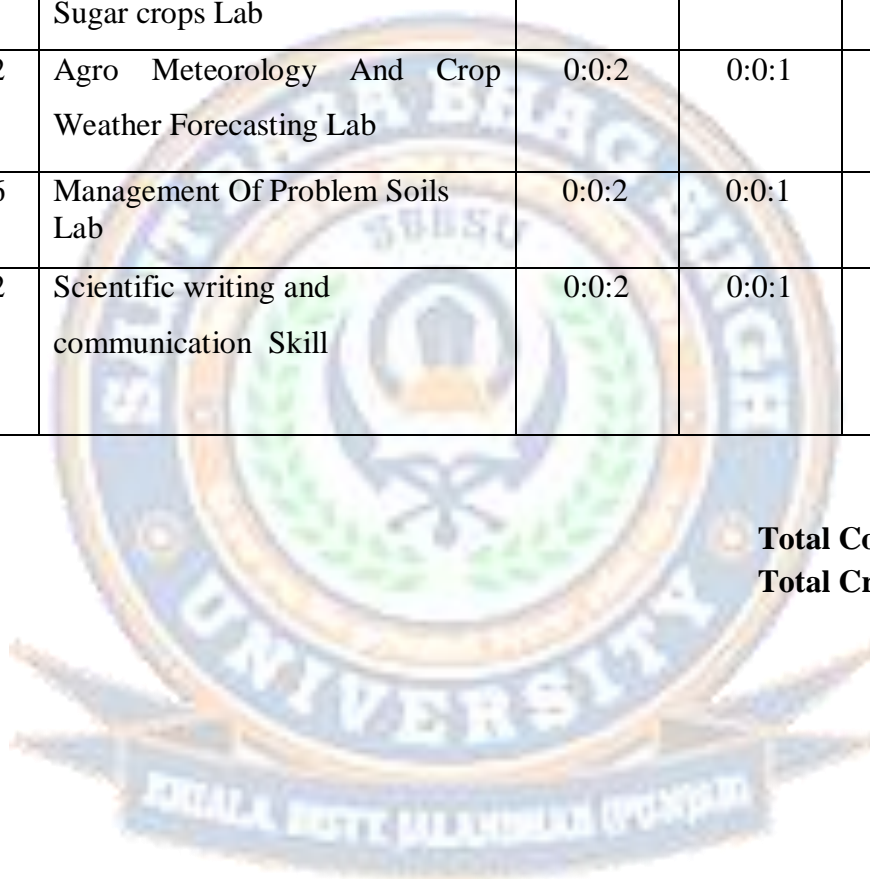
Total Credit Hours: 18

SEMESTER-II						
Sr. No.	Subject Code	Subject Name	Contact Hours (L:T:P)	Credits (L:T:P)	Total Contact Hours	Total Credit Hours
Theory Subjects						
1	AGR530	Principles and practices weed Management	2:0:0	2:0:0	2	2
2	AGR534	Agronomy of oilseed, fibre and Sugar crops	2:0:0	2:0:0	2	2
3	AGR522	Research	0:0:2	0:0:2	2	2
4	AGR524	Seminar	1:0:0	1:0:0	1	1
5	AGR560	Agro Meteorology And Crop Weather Forecasting	2:0:0	2:0:0	2	2
6	AGR542	Agricultural research, Research ethics and rural Development programmes	2:0:0	2:0:0	2	2
7	AGR514	Management Of Problem Soils	2:0:0	2:0:0	2	2
8	AGR548	Principles and practices of Organic farming	4:0:0	4:0:0	4	4

Practical Subjects						
1	AGR532	Principles and practices weed Management Lab	0:0:2	0:0:1	2	1
2	AGR536	Agronomy of oilseed, fibre and Sugar crops Lab	0:0:2	0:0:1	2	1
3	AGR562	Agro Meteorology And Crop Weather Forecasting Lab	0:0:2	0:0:1	2	1
4	AGR516	Management Of Problem Soils Lab	0:0:2	0:0:1	2	1
5	AGR552	Scientific writing and communication Skill	0:0:2	0:0:1	2	1

Total Contact hrs: 29

Total Credit Hours:22



SEMESTER-III						
S No.	Sub Code	Subject Name	Contact Hours (L:T:P)	Credits (L:T:P)	Total Contact Hours	Total Credit Hours
Theory Subjects						
1	AGR601	Seminar	1:0:0	1:0:0	1	1
2	AGR603	Research Work	0:0:9	0:0:9	9	9
3	AGR605	Qualifying exam	2:0:0	2:0:0	2	2
				Total	12	12

Total Contact hrs: 12
Total Credit Hours: 12

SEMESTER-IV						
S No.	Sub Code	Subject Name	Contact Hours (L:T:P)	Credits (L:T:P)	Total Contact Hours	Total Credit Hours
Theory Subjects						
1	AGR602	Research Work	0:0:9	0:0:9	9	9
				Total	9	9

Total Contact hrs: 9
Total Credit Hours: 9

Course Scheme Summary

Semester	L	T	P	Contact hrs/wk	Credits	Training
1	14	0	8	22	18	
2	17	0	10	29	22	
3	4	0	9	12	12	
4	0	0	9	9	9	
Total	35	0	36	72	61	



SEMESTER-I

Course Code	AGR525
Course Title	Modern concepts in crop production
Type of course	Theory
L T P	3 0 0
Credits	3 0 0
Course prerequisite	B.Sc (Agriculture)
Course Objectives	To teach the basic concepts of soil management and crop production.

Syllabus

Theory

UNIT- I

Crop growth analysis in relation to environment; geo-ecological zones of India, Quantitative agrobiological principles and inverse yield nitrogen law; Mitscherlich yield equation, its interpretation and applicability; Baule unit.

UNIT- II

Effect of lodging in cereals; physiology of grain yield in cereals; optimization of plant population and planting geometry in relation to different resources, Concept of ideal plant type and crop modelling for desired crop yield.

UNIT -III

Scientific principles of crop production; crop response production functions; concept of soil plant relations; yield and environmental stress.

UNIT -IV

Integrated farming systems, organic farming, and resource conservation technology including modern concept of tillage; dry farming; determining the nutrient needs for yield potentiality of crop plants, concept of balance nutrition and integrated nutrient management; precision agriculture.

Recommended Books:

S. No	Name	Author(S)	Publisher
1	Principles of crop production	SR Reddy	Kalyani publishers
2	Principles of agronomy	Reddi and Reddy	Kalyani publishers
3	Principles of agronomy	SR Reddy	Kalyani publishers

Course Code	AGR527
Course Title	Principles and practices of soil fertility and nutrient management
Type of course	Theory
L T P	2 0 0
Credits	2 0 0
Course prerequisite	B.Sc (Agriculture)
Course Objectives	To assess nutrient status of soil-crop system To promote practices that ensure sustainable and economically viable use of fertilizer

Syllabus

Theory

UNIT- I

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.

UNIT-II

Criteria of essentiality of nutrients; Essential plant nutrients - their functions, nutrient deficiency symptoms; transformation and dynamics of major plant nutrients; Preparation and use of farmyard manure, compost, green manures, vermicompost, biofertilizers and other organic concentrates their composition, availability and crop responses; recycling of organic wastes and residue management.

UNIT- III

Commercial fertilizers; composition, relative fertilizer value and cost; crop response to different nutrients, residual effects and fertilizer use efficiency, fertilizer mixtures and grades; agronomic, chemical and physiological methods of increasing fertilizer use efficiency; nutrient interactions.

UNIT-IV

Time 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 vermin-compost and residue wastes in crops.

Recommended Books:

S.No.	Name	Author(S)	Publisher
1	Introductory soil science	Dilip Kumar Das	Kalyani publishers
2	Fertilizers-Atextbook	Ranjan Kumar Das	Kalyani publishers
3	Manures and fertilizers	P C Das	Kalyani publishers

Course Code	AGR 531
Course Title	Agronomy of major cereals and pulses
Type of course	Theory
L T P	3 0 0
Credits	3 0 0
Course prerequisite	B.Sc (Agriculture)
Course Objectives	To enable the students to understand- <ul style="list-style-type: none"> • Packaging and practices of cereals and pulses • Processing of cereals and pulses • Storage of cereals and pulses

Syllabus

Theory:

UNIT-I

Origin and history, area and production, classification, improved varieties, adaptability, climate, soil, water and cultural requirements, nutrition, quality components, handling and processing of the produce for maximum production of rice, wheat, maize, sorghum, barley and pearl millet.

UNIT-II

Origin and history, area and production, classification, improved varieties, adaptability, climate, soil, water and cultural requirements, nutrition, quality components, handling and processing of the produce for maximum production of proso millet, finger millet, barnyard millet, kodo and kakun.

UNIT-III

Origin and history, area and production, classification, improved varieties, adaptability, climate, soil, water and cultural requirements, nutrition, quality components, handling and processing of the produce for maximum production of chickpea, Pigeonpea, soybean, pea, lentil, cowpea, greengram, blackgram, redgram and french bean.

UNIT-IV

Diseases and pests of cereal and pulse crops and their control measures.

Recommended Books:

S.No.	Name	Author(S)	Publisher
1	Agronomy of field crops	SR Reddy	Kalyani publishers
2	Principles and practices of agronomy	SS Singh	Kalyani publishers
3	Modern techniques of raising field crops	Chhidda singh	Kalyani publishers



Course Code	AGR511
Course Title	Genetics of crop plants
Type Course	Theory
L T P	2 0 0
Credits	2 0 0
Course Pre-requisite	B.Sc (Agriculture)
Course Objective (CO)	To study principle of genetics such as Mendelian traits, gene expression, epistasis, complementary interaction, supplementary, lethal interaction and polygenic inheritance etc.

Syllabus

UNIT-I

“Genetic improvement of plants” presents a comprehensive coverage of principle, theory and application of plant breeding for the genetic improvement of plants.

UNIT-II

Genetic and breeding, principles, chromosome numbers and manipulation, genetic recombination, monogenic and polygenic traits, continuous and discontinuous variations, concepts of direct and indirect selection.

UNIT-III

Objectives of selection, genetic gain, heritability and use those in breeding, genotype, environment interaction, fertility manipulation in breeding, methods for self and cross pollinating crops, breeding techniques for major self pollinating and cross pollinating crops,

UNIT-IV

Double haploid breeding technique, development of hybrid varieties, cultivar release, maintenance, and seed increase. In addition, the course will also cover basic introductory concepts to Biotech crops, gene technologies for crop improvement, molecular markers, marker assisted breeding, transgenic approach of plant improvement.

Recommended books:-

S.No.	Name	Author(S)	Publisher
1	Principle of Genetics	Gardner	Wiley
2	Genetics	B.D.Singh	Kalyani
3	Molecular marker in Plants	Robert J. Henry	Wiley

Course Code	MAT513
Course Title	Statistical methods & Experimental designs
Type of Course	Theory
L T P	2 0 0
Credits	2 0 0
Course Prerequisite	B.Sc (Agriculture)
Course Objectives	Mathematics is really a great tool to understand the things correctly. The aim of the course is to enable students : (1) To understand the theory knowledge as well as practical knowledge of different formulas.(2) To inculcate the skills to use different methods to solve the applied problems. (3) To check the accuracy of every formula by using different strategies. (4) To give them a sound foundation that eventually will help them in their coming technical futures.

Syllabus

UNIT-I

Definition of statistics, scope and limitation. Measure of central tendency– AM, Mode, medium, GM. Measure of dispersion-Quardile deviation, SD, CV. Skewness and Kurtosis. Probability and fitting of standard frequency distribution, sampling techniques, sampling distributions, mean and standard error, simple partial, multiple and intra- class correlation and multiple regressions.

UNIT-II

Correlation and regression- Simple, multiple. Partial Correlation coefficient, multiple Correlation, interclass Correlation. Test of significance – Small sample test (t, paired t test, difference between two mean).

UNIT-III

Large sample test- Z test for single mean, Z test for difference between two mean, Z test for proportion. Chi-square and large sample tests.

UNIT-IV

F test- To test equity of variance, to test difference between variance Design of experiments: Preliminaries, Principle of experiment design. ANOVA- One way Classification (CRD), two way Classification (RBD).

Recommended books:

S. No	Name	Author(S)	Publisher
1	Statistical Method for Research workers	Singh, S, Singh, T.P Babsal, M.L and Kumar R	Kalyani Publishers, Ludhiana
2	Statistical methods for agricultural workers,	Panse, V.G., Shaw, F.J., and Sukhatme, P.V.	Indian Council of Agricultural Research,



Course Code	AGR533
Course Title	Dryland farming and watershed management
Type Course	Theory
L T P	2 0 0
Credits	2 0 0
Course Pre-requisite	B.Sc (Agriculture)
Course Objectives	<ol style="list-style-type: none"> 1. Development of improved production technologies and cropping systems for dryland agriculture 2. To protect and enhance the water resource originating in the watershed.

Syllabus

Theory

UNIT-I

Definition, concept and characteristics of dry land farming; dry land versus rainfed farming; significance and dimensions of dry land farming in Indian agriculture. Soil and climatic parameters with special emphasis on rainfall characteristics; constraints limiting crop production in dry land areas; types of drought.

UNIT-II

Characterization of environment for water availability; crop planning for erratic and aberrant weather conditions. Stress physiology and resistance to drought, adaptation of crop plants to drought, drought management strategies; preparation of appropriate crop plans for dry land areas; mid contingent plan for aberrant weather conditions.

UNIT-III

Tillage, tilth, frequency and depth of cultivation, compaction in soil tillage; concept of conservation tillage; tillage in relation to weed control and moisture conservation; techniques and practices of soil moisture conservation (use of mulches, kinds, effectiveness and economics); anti-transpirants.

UNIT-IV

Soil and crop management techniques, seeding and efficient fertilizer use. Concept of watershed resource management, problems, approach and components.

Recommended books:

S. No	Name	Author(S)	Publisher
1	Principles of crop production	SR Reddy	Kalyani publishers
2	Principles of agronomy	Reddi and Reddy	Kalyani publishers
3	Principles of agronomy	SR Reddy	Kalyani publishers

Course Code	LIS501
Course Title	Library and information services
Type of course	Practical
L T P	0 0 2
Credits	0 0 1
Course prerequisite	B.Sc (Agriculture)
Course objectives	1.Educate and assist students in the identification and effective use of information resources 2. Provide current library materials and databases that support the academic curriculum.

Syllabus

Practical

1. Introduction to Library and its Services;
2. Five Laws of Library Science;
3. Type of Documents;
4. Classification and Cataloguing of Documents;
5. Organization of Documents in a Library;
6. Sources of Information – Primary, Secondary and Tertiary;
7. Use of Online Public Access Catalogue;
8. Use of Computerized Library Services;
9. E-resources and its Access Methods.

S.No.	Name	Author(S)	Publisher
1.	Manual of Library and Information Services	Bhanu Pratap	STUDERA PRESS

Course Code	AGR517
Course Title	Basic concepts in laboratory techniques
Type of course	Practical
L T P	0 0 2
Credits	0 0 1
Course prerequisite	B.Sc (Agriculture)
Course objectives	<p>1.To familiarize students with experimental apparatus, the scientific method, and methods of data analysis so that they will have some idea of the inductive process by which the ideas were originated.</p> <p>2.To teach how to make careful experimental observations and how to think about and draw conclusions from such data.</p>

Syllabus

Practical

1. Safety measures while in Lab; Handling of chemical substances
2. Use of burettes, pipettes, measuring cylinders, flasks, separatory funnel, condensers, micropipettes and vascupets; washing, drying and sterilization of glassware.
3. Drying of solvents/chemicals.
4. Weighing and preparation of solutions of different strengths and their dilution.
5. Handling techniques of solutions;
6. Preparation of different agrochemical doses in field and pot applications;
7. Preparation of solutions of acids.
8. Neutralization of acid and bases.
9. Preparation of buffers of different strengths and pH values.
10. Use and handling of microscope, laminar flow, vacuum pumps.
11. Viscometer, thermometer, magnetic stirrer, micro-ovens, incubators, sand bath, water bath, oilbath.
12. Electric wiring and earthing.
13. Preparation of media and methods of sterilization; Seed viability testing, testing of pollen viability; Tissue culture of crop plants.
14. Description of flowering plants in botanical terms in relation to taxonomy.

Recommended Books:

S.No.	Name	Author(S)	Publisher
1	Bioscience laboratory techniques	Bonner and Harjreaves	Wiley-Blackwell

Course Code	AGR-529
Course Title	Principles and practices of soil Fertility and nutrient management Lab
Type of course	Practical
L T P	0 0 2
Credits	0 0 1
Course prerequisite	B.Sc (Agriculture)
Course Objective	To make student aware of different methods to estimate soil nutrients and their interaction with yield.

Syllabus

Practical

1. Determination of soil pH, EC, organic C, total N, available N, P and K in soils
2. Determination of total N, P and K in plants
3. Interpretation of interaction effects and computation of economic and yield optima

Recommended book:

S.No.	Name	Author(S)	Publisher
1	The nature and properties of soils	Brady NC and Weil R R	Pearson Edu.
2	Soil fertility and fertilizers	Tisdale S L W Land Nelson	Prentice Hall

Course Code	AGR531
Course Title	Agronomy of major cereals and pulses Lab
Type of course	Practical
L T P	0 0 2
Credits	0 0 1
Course prerequisite	B.Sc (Agriculture)
Course objectives	To study how to calculate seed rate, CGR,RGR,NAR and other parameters related to crop production

Syllabus

Practical

1. Phenological studies at different growth stages of crop
2. Estimation of crop yield on the basis of yield attributes.
3. Formulation of cropping schemes for various farm sizes and calculation of cropping and rotational intensities.
4. Working out growth indices (CER, CGR, RGR, NAR, LAD), aggressiveness, relative crowding coefficient, monetary yield advantage and ATER of prominent intercropping systems of different crops
5. Estimation of protein content in pulses
6. Planning and layout of field experiments
7. Judging of physiological maturity in different crops, Intercultural operations in different crops.
8. Determination of cost of cultivation of different crops
9. Working out harvest index of various crops
10. Study of seed production techniques in various crops
11. Visit of field experiments on cultural, fertilizer, weed control and water management aspects
12. Visit to nearby villages for identification of constraints in crop production.

Recommended book:

S.No.	Name	Author(S)	Publisher
1	Principles of crop production	S R Reddy	Kalyani publishers

SEMESTER II

Course Code	AGR530
Course Title	Principles and practices of weed management
Type of course	Theory
L T P	2 0 0
Credits	2 0 0
Course prerequisite	B.Sc (Agriculture)
Course Objectives	1.Weed density should be reduced to tolerable levels 2.Reducing the amount of damage a given density of weeds inflicts on a crop 3. Shifting the composition of weed communities from undesirable to desirable species.

Syllabus

Theory

UNIT I

Weed biology and ecology, crop-weed competition including allelopathy; principles and methods of weed control and classification; weed indices; Herbicides introduction and history of their development.

UNIT-II

Classification based on chemical, physiological application and selectivity; mode and mechanism of action of herbicides; Herbicide structure - activity relationship; factors affecting the efficiency of herbicides; herbicide formulations, herbicide mixtures; herbicide resistance and management.

UNIT III

Weed control through bio-herbicides, myco-herbicides and allelochemicals; Degradation of herbicides in soil and plants; herbicide resistance in weeds and crops; herbicide rotation.

UNIT-IV

Weed management in major crops and cropping systems; parasitic weeds; weed shifts in cropping systems; aquatic and perennial weed control; Integrated weed management; cost : benefit analysis of weed management.

Recommended books:

S.No.	Name	Author(S)	Publisher
1	Principles of weed science	VS Rao	Oxford and IBH
2	Weed management principles and practices	O P Gupta	Kalyani publishers
3	Fundamentals of weed science	O P Gupta	Kalyani publishers

Course Code	AGR534
Course Title	Agronomy of oilseed, fibre and sugar crops
Type of course	Theory
L T P	2 0 0
Credits	2 0 0
Course prerequisite	B.Sc (Agriculture)
Course Objectives	To enable the students to understand- <ul style="list-style-type: none"> • Packaging and practices of oilseed, fibre and sugar crops • Processing of oilseed, fibre and sugar crops • Storage of oilseed, fibre and sugar crops

Syllabus

Theory

UNIT I

Origin and history, area and production, classification, improved varieties, adaptability, climate, soil, water and cultural requirements, nutrition quality component, handling and processing of the produce for maximum production of : *Rabi* oilseeds – Rapeseed and mustard, linseed.

UNIT II

Origin and history, area and production, classification improved varieties, adaptability, climate, soil, water and cultural requirements, nutrition quality component, handling and processing of the produce for maximum production of *Kharif* oilseeds - Groundnut, sesame, castor, sunflower, soybean etc.

UNIT III

Origin and history, area and production, classification improved varieties, adaptability, climate, soil, water and cultural requirements, nutrition quality component, handling and processing of the produce for maximum production of Fiber crops - Cotton, jute, sunhemp etc.

UNIT IV

Origin and history, area and production, classification improved varieties, adaptability, climate, soil, water and cultural requirements, nutrition quality component, handling and processing of the produce for maximum production of sugar crops-sugarcane and sugarbeet.

Recommended books:

S.No.	Name	Author(S)	Publisher
1	Agronomy of field crops	SR Reddy	Kalyani publishers
2	Principles and practices of agronomy	SS Singh	Kalyani publishers
3	Modern techniques of raising field crops	Chhida singh	Kalyani publishers



Course Code	AGR560
Course Title	Agro Meteorology And Crop Weather Forecasting
Type of course	Theory
L T P	2 0 0
Credits	2 0 0
Course prerequisite	B.Sc (Agriculture)
Course Objectives	To enable the students to understand- <ul style="list-style-type: none"> • Scope of meteorology in relation to crop environment • Weather forecasting in India

Syllabus

UNIT I

Agro meteorology - aim, scope and development in relation to crop environment; composition of atmosphere, distribution of atmospheric pressure and wind. Characteristics of solar radiation; energy balance of atmosphere system; radiation distribution in plant canopies, radiation utilization by field crops; photosynthesis and efficiency of radiation utilization by field crops; energy budget of plant canopies; environmental temperature: soil, air and canopy temperature.

UNIT II

Temperature profile in air, soil, crop canopies; soil and air temperature effects on plant processes; environmental moisture and evaporation: measures of atmospheric temperature and relative humidity vapor pressure and their relationships; evapo-transpiration and meteorological factors determining evapo-transpiration.

UNIT III

Modification of plant environment: artificial rain making, heat transfer, controlling heat load, heat trapping and shading; protection from cold, sensible and latent heat flux, controlling soil moisture; monsoon and their origin, characteristics of monsoon; onset, progress and withdrawal of monsoon; weather hazards, drought monitoring and planning for mitigation.

UNIT IV

Weather forecasting in India - short, medium and long range; aerospace science and weather forecasting; benefits of weather services to agriculture, remote sensing; application in agriculture and its present status in India; atmospheric pollution and its effect on climate and crop production; climate change and its impact on agriculture.

Recommended books:

S. No	Name	Author(S)	Publisher
1	Agro-meteorology and climatology: A teaching material for Plant and Natural Resource Students	Merkebum Getachew	LAP LAMBERT Academic Publishing
2	Agricultural Meteorology	Rao , Prasada	Prentice Hall India Learning Private Limited
3	Principles of Agricultural Meteorology	B.M.,Sahu, D.D. Mote	Scientific Publishers



Course Code	AGR514
Course Title	Management Of Problem Soils
Type of course	Theory
L T P	2 0 0
Credits	2 0 0
Course prerequisite	B.Sc (Agriculture)
Course Objectives	To provide high quality, comprehensive educational and training opportunities those are compatible to changing needs of the students. Soil conservation is a field that provides broad training in soil physics and basic training in soil science. Our soil conservation program aims to educate students to become professionals with in-depth knowledge and skills.

Syllabus

UNIT I

Problem soils classification and distribution. Nature and properties of saline, alkali and acidic soils.

UNIT II

Plant responses to soil reaction, extent of damage to crops, salt tolerance of the crops. Management and improvement of saline, alkali and acidic soils.

UNIT III

Excess soil water conditions – sources and occurrences. Rainfall analysis and water balance. Effect of excess soil water on crop growth.

UNIT IV

Management of excess soil water, water fluctuation and side movements, lowering of water table for successful crop production. Degraded soils and their rehabilitation.

Recommended Books:

S. No	Name	Author(S)	Publisher
1	Soil Erosion and Conservation	R.P.C. Morgan	Wiley-india
2	Soil Erosion and Conservation	S.A. El-Swaify, W.C. Moldenhauer	
3	Soil and Water Conservation Engineering	Suresh	Standard Publication group

Course Code	AGR522
Course Title	Research
Type of course	Practical
L T P	0 0 2
Credits	0 0 2
Course prerequisite	B.Sc (Agriculture)

RESEARCH

Course Code	AGR524
Course Title	Seminar
Type of course	theory
L T P	1 0 0
Credits	1 0 0
Course prerequisite	B.Sc (Agriculture)

SEMINAR

Course Code	AGR542
Course Title	Agricultural, research ethics and rural development programmes
Type of course	Theory
L T P	2 0 0
Credits	2 0 0
Course prerequisite	B.Sc (Agriculture)
Course Objectives	To gain knowledge of best agriculture research ethics.

Syllabus

Theory

UNIT- I

History of agriculture in brief; Global agricultural research system: need, scope, opportunities; Role in promoting food security, reducing poverty and protecting the environment; National Agricultural Research Systems (NARS) and Regional Agricultural Research Institutions; Consultative Group on International Agricultural Research (CGIAR): International Agricultural Research Centres (IARC), partnership with NARS.

UNIT-II

Role as a partner in the global agricultural research system, strengthening capacities at national and regional levels; International fellowships for scientific mobility. Research ethics: research integrity, research safety in laboratories, welfare of animals used in research, computer ethics, standards and problems in research ethics.

UNIT III

Concept and connotations of rural development, rural development policies and strategies. Rural development programmes: Community Development Programme, Intensive Agricultural District Programme.

UNIT-IV

Special group – Area Specific Programme, Integrated Rural Development Programme (IRDP) Panchayati Raj Institutions, Co-operatives, Voluntary Agencies/Non-Governmental Organisations. Critical evaluation of rural development policies and programmes. Constraints in implementation of rural policies and programmes.

Recommended books:

S. No	Name	Author(S)	Publisher
1	Textbook of Research Ethics	Loue, Sana	Springer
2	Agriculture and Rural Development in India: Post-Liberalisation Initiatives	Astha Ahuja	New Century Publications

Course Code	AGR548
Course Title	Principles and practices of organic farming
Type of course	Theory
L T P	4 0 0
Credits	4 0 0
Course prerequisite	B.Sc (Agriculture)
Course Objectives	To develop a sustainable agriculture system for guaranteed adequate food production in the foreseeable future

Syllabus

Theory

UNIT I

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

UNIT-II

Organic farming and water use efficiency; soil fertility, nutrient recycling, organic residues, organic manures, composting, soil biota and decomposition of organic residues, earthworms and vermicompost, green manures and biofertilizers.

UNIT III

Farming systems, crop rotations, multiple and relay cropping systems, intercropping in relation to maintenance of soil productivity. Control of weeds, diseases and insect pest management, biological agents and pheromones, biopesticides.

UNIT-IV

Socio-economic impacts; marketing and export potential: inspection, certification, labeling and accreditation procedures; organic farming and national economy.

Recommended Books:

S. No	Name	Author(S)	Publisher
1	Organic farming	Lampin	Press books, Ipswitch, UK
2	Organic farming-Theory and practice	Palaniappan S P and Anandurai K	Scientific publication
3	A handbook of organic farming	A K Sharma	Agrobios



Course Code	AGR552
Course Title	Scientific writing and communication Skill Lab
Type of course	Practical
L T P	0 0 2
Credits	0 0 1
Course prerequisite	B.Sc (Agriculture)
Course Objectives	1. Act ethically in their role in the communication skills 2. Act critically as they apply principles taught in the course to communication situations.

Syllabus

Practical

UNIT-I

Technical Writing - Various forms of scientific writings - theses, 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)

UNIT-II

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.

UNIT-III

Writing of numbers and dates in scientific write-ups; Editing and proof-reading; Writing of a review article.

UNIT-IV

Communication Skills - Grammar (Tenses, parts of speech, clauses, punctuation marks); Error analysis (Common errors); Concord; Collocation; Phonetic symbols and transcription; Accentual pattern: Weak forms in connected speech: Participation in group discussion: Facing an interview; presentation of scientific papers.

Recommended Books:

S. No	Name	Author(S)	Publisher
1	Technical Communication	Riordan	
2	Technical Report Writing Today	Daniel G. Riordan	Houghton Mifflin Company

Course Code	AGR532
Course Title	Principles and practices of weed management lab
Type of course	Practical
L T P	0 0 2
Credits	0 0 1
Course prerequisite	B.Sc (Agriculture)
Course Objectives	To implement integrated weed management practices that are ecologically sustainable and financially viable.

Syllabus

Practical

1. Identification of important weeds of different crops
2. Preparation of a weed herbarium
3. Weed survey in crops and cropping systems
4. Crop-weed competition studies
5. Preparation of spray solutions of herbicides for high and low-volume sprayers
6. Use of various types of spray pumps and nozzles and calculation of swath width
7. Economics of weed control
8. Herbicide resistance analysis in plant and soil Bioassay of herbicide resistance
9. Calculation of herbicidal requirement

Recommended Books:

S. No	Name	Author(S)	Publisher
1	Modern weed management	O P Gupta	Kalyani publishers

Course Code	AGR536
Course Title	Agronomy of oilseed, fibre and sugar crops lab
Type of course	Practical
L T P	0 0 2
Credits	0 0 1
Course prerequisite	B.Sc (Agriculture)
Course Objectives	To aware students about cropping schemes, phenological studies and other crop production techniques

Syllabus

Practical

1. Planning and layout of field experiments
2. Cutting of sugarcane setts, its treatment and methods of sowing, tying and propping of Sugarcane
3. Determination of cane maturity and calculation on purity percentage, recovery percentage and sucrose content in cane juice phenological studies at different growth stages of crop Intercultural operations in different crops
4. Cotton seed treatment
5. Working out growth indices (LER, CGR, RGR, NAR, LAD) aggressivity, relative crowding coefficient, monetary yield advantage and ATER of prominent intercropping systems
6. Judging of physiological maturity in different crops and working out harvest index
7. Working out cost of cultivation of different crops
8. Estimation of crop yield on the basis of yield attributes.
9. Formulation of cropping schemes for various farm sizes and calculation of cropping and rotational intensities
10. Determination of oil content in oilseeds and computation of oil yield
11. Estimation of quality of fibre of different fibre crops
12. Study of seed production techniques in various crops
13. Visit of field experiments on cultural, fertilizer, weed control and water management aspects
14. Visit to nearby villages for identification of constraints in crop production

Recommended Books:

S. No	Name	Author(S)	Publisher
1	Introduction to crops of india	Das N R	Scientific publication
2	Technology in sugarcane growing	Lakshmikantam N	Oxford and IBH

Course Code	AGR562
Course Title	Agro meteorology and crop weather forecasting Lab
Type of course	Practical
L T P	0 0 2
Credits	0 0 1
Course prerequisite	B.Sc (Agriculture)
Course Objectives	To obtain and understand meteorological data from observatory

Syllabus

Practicals

Visit to agro-meteorological observatory and to record sun-shine hours, wind velocity, wind direction, relative humidity, soil and air temperature, evaporation, precipitation and atmospheric pressure.

Measurement of solar radiation outside and within plant canopy.

Measurement/estimation of evapotranspiration by various methods.

Measurement/estimation of soil water balance.

Rainfall variability analysis.

Determination of heat -unit requirement for different crops

Measurement of crop canopy temperature

Measurement of soil temperatures at different depths.

Remote sensing and familiarization with agro advisory service bulletins

Study of synoptic charts and weather reports, working principle of automatic weather station.

Visit to solar observatory

Recommended Books:

S. No	Name	Author(S)	Publisher
1	Meteorology and Practical Meteorology: Data Acquisition Techniques, Instruments and Methods	S.R.Ghadekar	Agromet Publisher

Course Code	AGR516
Course Title	Management Of Problem Soils Lab
Type of course	Practical
L T P	0 0 2
Credits	0 0 1
Course prerequisite	B.Sc (Agriculture)
Course Objectives	1.To demonstrate the production and use of a fertilizer characterised by reduced salinity 2.Reducing the investment on fertilizer

Syllabus

Practicals

Determination of pH, E.C., gypsum requirement for sodic soils and lime requirement for acidic soils.

Determination of specific gravity, bulk density, porosity and soil texture.

Analysis of irrigation water.

Visit to areas of problem soils.

Recommended Books:

S. No	Name	Author(S)	Publisher
1	A Handbook of Soil-Plant-Water-Fertilizer and Manure Analysis	Durai, M.V.	NIPA

SEMESTER-III

Course Code	AGR519
Course Title	Seminar
Type of course	Theory
L T P	0 0 1
Credits	0 0 1
Course prerequisite	B.Sc (Agriculture)
Course objectives	Help students understand the importance of social trust, self-discipline and mutual obligation to individuals and societies

SEMINAR

Course Code	AGR521
Course Title	Research
Type of course	Practical
L T P	0 0 9
Credits	0 0 9
Course prerequisite	B.Sc (Agriculture)

RESEARCH

Course Code	AGR523
Course Title	Qualifying Exam
Type of course	Theory
L T P	2 0 0
Credits	2 0 0
Course prerequisite	B.Sc (Agriculture)

QUALIFYING EXAM

SEMESTER-IV

Course Code	AGR528
Course Title	Research
Type of course	Practical
L T P	0 0 9
Credits	0 0 9
Course prerequisite	B.Sc (Agriculture)

RESEARCH

