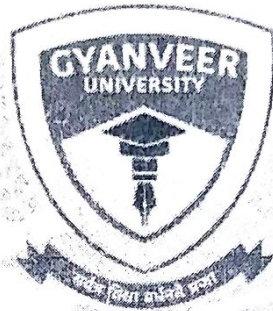


Academic Year: 2023-2024

M. Sc. (Ag) Agronomy



Syllabus & Scheme

Semester – I & II

School of Agricultural Science





GYANVEER UNIVERSITY, SAGAR (M.P.)
Scheme of Examination M.Sc (Agriculture-Agronomy) II Semester
School of Agricultural Science (Academic Session 2023-24)
Subject wise distribution of marks and corresponding credits

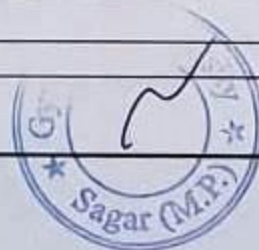
S. No.	Subject Type	Course	Subject Code	Paper Name	Maximum Marks Allotted										Total Marks	Contact Periods Per week			Credit Allotments	Total Credits
					Theory Slot				Practical Slot							L	T	P		
					End Term Exam	Internal Assessment Class test (Descriptive & Objective)/Assignment/Seminar			Internal Assessment			External Assessment								
						Final Exam	Internal Assessment I	Internal Assessment II	Internal Assessment III	Class test/Interaction	Attendance	Practical/Presentation/Lab Record	Viva Voce	Lab Work						
1	Major Course	M.Sc (Agriculture-Agronomy)	GUAGRO 201T	Principles and practices of weed management(Theory)	70	15	15	15	-	-	-	-	-	100	2	0	0	3(2+1)	2	
2	Major Course		GUAGRO 201P	Principles and practices of weed management(Practical)	-	-	-	-	10	10	10	10	10	50	0	0	1		1	
3	Major Course		GUAGRO 202T	Principles and practices of soil fertility and nutrient management(Theory)	70	15	15	15	-	-	-	-	-	100	2	0	0	3(2+1)	2	
4	Major Course		GUAGRO 202P	Principles and practices of soil fertility and nutrient management(Practical)	-	-	-	-	10	10	10	10	10	50	0	0	1		1	
5	Major Course		GUAGRO 203T	Agronomy of oilseeds, fiber and sugar crops(Theory)	70	15	15	15	-	-	-	-	-	100	2	0	0	3(2+1)	2	
6	Major Course		GUAGRO 203P	Agronomy of oilseeds, fiber and sugar crops(Practical)	-	-	-	-	10	10	10	10	10	50	0	0	1		1	
7	Major Course		GUAGRO 204T	Principles and practices of Organic Farming(Theory)	70	15	15	15	-	-	-	-	-	100	2	0	0	2(1+1)	2	
8	Major Course		GUAGRO 204P	Principles and practices of Organic Farming(Practical)	-	-	-	-	10	10	10	10	10	50	0	0	1		1	
9	Minor Course		GUAGRO 205T	Principles of Plant physiolog(Theory)	70	15	15	15	-	-	-	-	-	100	2	0	0	3(2+1)	2	
10	Minor Course		GUAGRO 205P	Principles of Plant physiolog(Practical)	-	-	-	-	10	10	10	10	10	50	0	0	1		1	
11	Supporting Course		GUAGRO 206T	Experimental design(Theory)	70	15	15	15	-	-	-	-	-	100	2	0	0	3(2+1)	2	
12	Supporting Course		GUAGRO 206P	Experimental design(Practical)	-	-	-	-	10	10	10	10	10	50	0	0	1		1	
13	Non Credit Course		GUAGRO 207T	Library and information services	No Credits															
14	Non Credit Course		GUAGRO 208T	Basic Concepts in Laboratory Techniques	No Credits															

Total of Credits = 18

note* Allotment of Marks for Internal Assessment for theory portion is Best of Two / either of two and addition of them.

*R: Remedial course;

** NC - Non Gradual Course



Course Title : GUAGRO 201T -PRINCIPLES AND PRACTICES OF WEED MANAGEMENT (Theory)

3 (2+1)

Objective

To familiarize the students about the weeds, herbicides and methods of weed control.

Theory

UNIT- I

Weed biology and ecology, crop-weed competition including allelopathy; principles and methods of weed control and classification; weed indices.

UNIT -II

Herbicides introduction and history of their development; classification based on chemical, physiological application and selectivity; mode and mechanism of action of herbicides.

UNIT -III

Herbicide structure - activity relationship; factors affecting the efficiency of herbicides; herbicide formulations, herbicide mixtures; herbicide resistance and management; 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.

UNIT- V

Integrated weed management; cost: benefit analysis of weed management.

**Course Title : GUAGRO 201P -PRINCIPLES AND PRACTICES OF WEED
MANAGEMENT (Practical)**

Practical

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

Suggested Readings

1. Aldrich RJ & Kramer RJ. 1997. Principles in Weed Management. Panima Publ. Ashton
FM & Crafts AS. 1981. Mode of Action of Herbicides. 2nd Ed. Wiley Inter-Science.
2. Gupta OP. 2007. Weed Management – Principles and Practices. Agrobios.
3. Mandal RC. 1990. Weed, Weedicides and Weed Control - Principles and Practices. Agro-
Botanical Publ.
4. Rao VS. 2000. Principles of Weed Science. Oxford & IBH.
5. Subramanian S. Ali AM & Kumar RJ. 1997. All About Weed Control. Kalyan i.
Zimdahl RL. 1999. Fundamentals of Weed Science. 2nd Ed. Academic Press. Kewat.
M.L. and Sharma, R.S. (2007). A Practical Manual for Weed Control, College of
Agriculture, JNVV, Jabalpur publication



**Course Title : GUAGRO 202T – PRINCIPLES AND PRACTICES OF
SOIL FERTILITY AND NUTRIENT MANAGEMENT (Theory) 3(2+1)**

Objective - To impart knowledge of fertilizers and manures as sources of plant nutrients and apprise about the integrated approach of plant nutrition and Sustainability of soil fertility.

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.

UNIT- III

Preparation and use of farmyard manure, compost, green manures, vermin compost, bio-fertilizers and other organic concentrates their composition, availability and crop responses; recycling of organic wastes and residue management.

UNIT -IV

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- V

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.



**Course Title : GUAGRO 202P – PRINCIPLES AND PRACTICES OF
SOIL FERTILITY AND NUTRIENT MANAGEMENT (Practical)**

Practical

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

Suggested Readings

1. Brady NC & Weil R.R 2002. The Nature and Properties of Soils. 13th Ed. Pearson Edu.
2. Havlin JL, Beaton JD, Tisdale SL & Nelson WL. 2006. Soil Fertility and Fertilizers. 7th Ed. Prentice Hall.
3. Prasad R & Power JF. 1997. Soil Fertility Management for Sustainable Agriculture. CRC Press.
4. Yawalkar KS, Agrawal JP & Bokde S. 2000. Manures and Fertilizers. Agri-Horti Publ



**Course Title : GUAGRO 203T - AGRONOMY OF OIL SEEDS,
FIBRE AND SUGAR CROPS (Theory)**

3(2+1)

Objective:-

Theory

To teach the crop husbandry of oilseed, fiber and sugar crops. 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 production of :-

UNIT I

Rabi oilseeds – Rapeseed and mustard, linseed, etc.

UNIT II

Kharif oilseeds - Groundnut, sesame, castor, sunflower, soybean etc.

UNIT III

Fiber crops - Cotton, jute, sunhemp etc.

UNIT IV

Sugar crops – Sugar-beet and sugarcane.



Course Title : GUAGRO 203P - AGRONOMY OF OIL SEEDS, FIBRE AND SUGAR CROPS (Practical)

PRACTICAL

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

Suggested Readings

1. Das NR. 2007. Introduction to Crops of India. Scientific Publ.
2. Das PC. 1997. Oilseed Crops of India. Kalyani.
3. Lakshmikantam N. 1983. Technology in Sugarcane Growing. 2 Ed. Oxford & IBH.
4. Prasad, Rajendra. 2002. Text Book of Field Crop Production. ICAR.
5. Singh C, Singh P & Singh R. 2003. Modern Techniques of Raising Field Crops. Oxford & IBH.
6. Singh SS. 1998. Crop Management. Kalyani.

Course Title : GUAGRO 204T -PRINCIPLES AND PRACTICES OF ORGANIC FARMING (Theory)

3(2+1)

Objective: To study the principles and practices of organic farming for sustainable crop production.

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.

UNIT- IV

Control of weeds, diseases and insect pest management, biological agents and pheromones, biopesticides.

UNIT- V

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



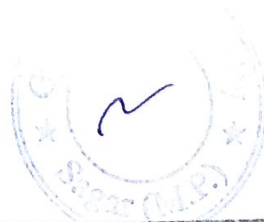
Course Title : GUAGRO 204P -PRINCIPLES AND PRACTICES OF ORGANIC FARMING (Practical)

Practical

1. Aerobic and anaerobic methods of making compost.
2. Making of vermicompost.
3. Identification and nursery raising of important agro-forestry trees and tress for shelter belts.
4. Efficient use of biofertilizers, technique of treating legume seeds with Rhizobium cultures, use of Azotobacter, Azospirillum, and PSB cultures infield.
5. Visit to an organic farm.
6. Quality standards, inspection, certification and labeling and accreditation procedures for farm produce from organic farms.

Suggested Readings

1. Lampin N. 1990. Organic Farming. Press Books, Ipswitch, UK.
2. Palaniappan SP & Anandurai K. 1999. Organic Farming–Theory and Practice.
3. Sharma A. 2002. Hand Book of Organic Farming. Agrobios.
4. Subba Rao NS. 2002. Soil Microbiology. Oxford & IBH.
5. Trivedi RN.1993. A Text Book of Environmental Sciences, Anmol Publ.
6. Veeresh GK, Shivashankar K & Suiglachar MA. 1997. Organic Farming and Sustainable Agriculture.



Course Title :GUAGRO 205T- PRINCIPLES OF CROP PHYSIOLOGY (Theory) 3(2+1)

Objective: To acquaint the students with the basic concepts of plant physiology and their application in agriculture.

Theory

UNIT I

Soil and plant water relations, water and its role in plants, properties and functions of water in the cell water relations-, water potential of plant cells.

UNIT II

Mechanism of water uptake by roots-transport in roots, Transpiration, factor influencing transpiration rate and theory of transpiration.

UNIT III

Stomata structure and function-mechanism of stomatal movement, antitranspirants. The role of mineral nutrients in plant metabolism: Essential elements, classification based on function of elements in plants

UNIT IV

Photosynthesis and its importance in plant . Photochemical process, photochemical reactions, CO₂ reduction in Calvin cycle. Carbon fixation in C₄,C₃ and CAM plants and its significance.

UNIT V

Growth and differentiation. Hormonal concept of growth and differentiation,plant growth hormones and their physiological role. Plant growth regulators, growth retardants., physiology of flowering- Photoperiodism and Vernalisation



Course Title : GUAGRO 205P- PRINCIPLES OF CROP PHYSIOLOGY (Practical)

Practical

1. Measurement of soil water status. Measurement of transpiration rate.
2. Stomatal physiology, influence of ABA on stomatal closing. Deficiency symptoms of nutrients.
3. To study about different growth regulators.
4. Demonstration of photoperiodic response of plants in terms of flowering.

Suggested Readings

1. Hopkins WG & Huner NPA. 2004. Introduction to Plant Physiology.
2. John Wiley & Sons. Salisbury FB & Ross C. 1992.
3. Plant Physiology. 4th Ed. Wadsworth Publ. Taiz L & Zeiger E. 2006.
4. Plant Physiology. 4th Ed. Sinauer Associates



Course Title : GUAGRO 206T- EXPERIMENTAL DESIGNS (Theory)

3(2+1)

Objective

This course is meant for students of agricultural and animal sciences other than Statistics. Designing an experiment is an integrated component of research in almost all sciences. The students would be exposed to concepts of Design of Experiments so as to enable them to understand the concepts involved in planning, designing their experiments and analysis of experimental data.

Theory

UNIT I

Need for designing of experiments, characteristics of a good design. Basic principles of designs-randomization, replication and local control.

UNIT II

Uniformity trials, size and shape of plots and blocks; Analysis of variance: Completely randomized design, randomized block design and Latin square design.

UNIT III

Factorial experiments, (symmetrical as well as asymmetrical). orthogonality and partitioning of degrees of freedom, Confounding in symmetrical factorial experiments. Factorial experiments with control treatment.

UNIT IV

Split plot and strip plot designs; Analysis of covariance and missing plot techniques in randomized block and Latin square designs; Transformations, crossover designs, balanced incomplete block design, resolvable designs and their applications ~ Lattice design, alpha design-concepts, randomisation procedure, analysis and interpretation of results. Response surfaces. Experiments with mixtures.

UNIT V

Bioassays- direct and indirect, indirect assays based on quantal dose response, parallel line and slope ratio assays potency estimation.



Course Title : GUAGRO 206P- EXPERIMENTAL DESIGNS (Practical)

Practical

1. Uniformity trial data analysis, formation of plots and blocks,
2. Fairfield Smith Law; Analysis of data obtained from CRD, RBD, LSD
3. Analysis of factorial experiments without and with confounding; Analysis with missing data; Split plot and strip plot designs
4. Transformation of data; Analysis of resolvable designs
5. Fitting of response surfaces.

Suggested Readings

1. Cochran WG & Cox GM. 1957. Experimental Designs. 2nd Ed. John Wiley.
2. Dean AM & Voss D. 1999. Design and Analysis of Experiments. Springer.
3. Federer WT. 1985. Experimental Designs. MacMillan. Fisher RA. 1953.
4. Design and Analysis of Experiments. Oliver & Boyd.
5. Nigam AK & Gupta VK. 1979. Handbook on Analysis of Agricultural Experiments. IASRI Publ. Pearce SC. 1983.
6. The Agricultural Field Experiment: A Statistical Examination of Theory and Practice. John Wiley. Design Resources Server: www.iasri.res.in/design.



Course Title : GUAGRO – 207T Library and Information Services

Theory

UNIT I

To equip the library users with skills to trace information from libraries efficiently,

UNIT II

To apprise them of information and knowledge resources,

UNIT III

To carry out literature survey

UNIT IV

To formulate information search strategies,

UNIT V

To use modern tools (Internet, OPAC, search engines etc.) of information search.

Practical

1. Introduction to library and its services; Role of libraries in education, research and technology transfer;
2. Classification systems and organization of library; Sources of information- Primary Sources, Secondary Sources and Tertiary Sources;
3. Intricacies of abstracting and indexing services (Science Citation Index, Biological Abstracts, Chemical Abstracts, CABI Abstracts, etc.);
4. Tracing information from reference sources;
5. Literature survey; Citation techniques / Preparation of bibliography;
6. Use of CD-ROM Databases, Online Public Access Catalogue and other computerized library services;
7. Use of Internet including search engines and its resources; ere sources access methods.



Course Title : GUAGRO – 208T: Basic Concepts in Laboratory Techniques

Theory

To acquaint the students about the basics of commonly used techniques in laboratory.

Practical:

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

Suggested Readings

1. Furr AK. 2000. CRC Hand Book of Laboratory Safety. CRC Press.
2. Gabb MH & Latchem WE.1968. A Handbook of Laboratory Solutions. Chemical Publ. Co.8. FMPE 503: Testing and Evaluation of Tractors and Farm Equipment

