

Syllabus
B. Sc. (Ag) Hons. Part-II, Semester-I
Agriculture University, Jodhpur

Courses & Credits

Course No.	Course Title	Credits
AGRON-4211	Field crops-I (Kharif)	3(2+1)
AGRON-4212	Weed Management	2(1+1)
NEMAT-4211	Introductory Nematology	2(1+1)
STAT-4211	Statistics	3(2+1)
EXTED-4211	Fundamentals of Rural Sociology and Educational Psychology	2(2+0)
HORT-4211	Production Technology of Fruit and plantation Crops	3(2+1)
AECON-4211	Production Economics and Farm Management	2(1+1)
AENGG-4211	Farm power and machinery	2(1+1)
SCHEM-4211	Manures and Fertilizers	2(1+1)
NSNC-4221	NCC/NSS	-
	Total	21(13+8)



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AGRON-4211

Field Crops-I (Kharif)

3(2+1)

Theory:

Origin, geographic distribution, importance, soil and climatic requirement, varieties; cultural practices *viz.* seed and sowing, inter-cultural operations, fertilizer, water and weed management, plant protection; harvesting and yield of – rice, maize, sorghum, (grain and forage), pearl millet (grain and forage); pigeonpea, groundnut, soybean and cotton; Package of practices of mungbean, urdbean, cowpea, mothbean, clusterbean, sunhemp, castor, sesame, minor millets and napier. Acquaintance about *Panicum*, *Lasiurus* and *Cenchrus*.

Practical:

Rice nursery preparation, seed bed preparation and sowing of *kharif* crops; Calculations on seed rate; Sowing of mungbean, pearl millet, and cotton; Effect of seed size on germination and seedling vigour; Identification of weeds in pearl millet and other crops; Fertilizer application and top dressing of nitrogen in pearl millet and study on fertilizer experiments; Study of yield contributing characters, yield calculations, harvesting and yield estimation; Study of crop varieties and important agronomic experiments.

Suggested Readings:

1. Singh, Chhidda; Singh P. and Singh, R. 2003. Modern Techniques of Raising Field Crops, Oxford & IBH Publishing Co., New Delhi.
2. Singh, S.S. 1998, Crop Management : Under irrigated and rainfed conditions.
3. Singh, S.S. 1993, Principles and Practices of Agronomy, Kalyani Publishers, New Delhi.
4. Reddy, T.Y. and Reddi, G.H.S. 1993. Principles of Agronomy, Kalyani Publishers, New Delhi.
5. Maiti, S., Hedge, M.R. and Chhattacharyay, S.B. 1988. Handbook of Annual Oil Seed Crops. Oxford & IBH Publishing Co., New Delhi.
6. Jaiswami, L.H. and Baldeo, B. 1990. Advances in Pulse Production Technology, ICAR, New Delhi.
7. Thakur, C. 1979. Crop Production, Vol. I & II. Metropolitan Book Pvt. Ltd., New Delhi.
8. Ahlawat, I.P.S., Sharma, O.P. & Saini, G.S. 1998 Scientific Crop Production in India. Aman Publishing House, Madhu Market, Budhana gate, Meerut.
9. Rathore, P.S. 1999-2000. Techniques and Management of Field Crop Production. Agrobios (India), Jodhpur.
10. Rathore, P.S. and Sharma, S.K. 2003. Scientific Pulse Production. Yash Publishing House, Bikaner.
11. Sharma, Kalicharan 1990 Bharat ki pramukh fasle. G.B. Pant Agricultural & Technology University, Nainital.
12. Reddy, S.R. 2004. Agronomy of Field Crops. Kalyani Publishers, New- Delhi.

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AGRON- 4212

Weed Management

2(1+1)

Theory:

Weeds- introduction, harmful and beneficial effects, classification, propagation and dissemination; Weed biology and ecology, crop weed association, crop weed competition and allelopathy; Concepts of weed prevention, control and eradication; Methods of weed control- physical, cultural, chemical and biological methods; Integrated weed management; Herbicides- advantages and limitation of herbicide usage in India; Herbicide classification, formulations, methods of application; Introduction to Adjuvants and their use in herbicides; Introduction to selectivity of herbicides; Compatibility of herbicides with other agro chemicals; Weed management in major field crops. Aquatic weeds and their management.

Practical:

Identification of weeds; Preparation of herbarium of weeds; Study of crop weed competition ; Herbicide label information; Computation of herbicide doses; Study of herbicide application equipment and calibration; Demonstration of methods of herbicide application; Preparation of list of commonly available herbicides; Study of phytotoxicity symptoms of herbicides in different crops; Biology of nut sedge, bermuda grass, *Parthenium* and *Celosia*; Economics of weed control practices; visits of problem areas (field).

Suggested Readings:

- 1 Gupta , O.P. 2005. Weed Management: Principles and Practices (2nd Ed) Agribios (India) , Jodhpur.
- 2 Gupta, O.P. 2002 . Modern Weed Management, Agribios (India) Jodhpur.
- 3 Rao, V.S. 2000. Principles of Weed Science (2nd Ed) , Oxford & IBH Publishing Co., New-Delhi.
- 4 Saraswat, V.N., Bhan, V.M. and Yaduraju, N.T. 2003. Weed Management, ICAR, New-Delhi.

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NEMAT-4211

Introductory Nematology

2(1+1)

Theory:

History and economic importance of plant parasitic nematodes; Characters of Phylum Nematoda and systematic position of plant parasitic nematodes (outline classification upto Generic level); General morphology, ecology and biology; Plant nematode relationship; Kinds of parasitism and symptomology; Nematode interaction with other micro-organisms; Nematode diseases of crop plants of economic importance in State with special reference to *Meloidogyne* spp; *Heterodera avenae*, *Anguina tritici* and *Rotylenchulus reniformis* *Tylenchulus semipenetrans*; Principles of nematode management.

Practical:

Study of compound microscope alongwith other laboratory necessities, Survey and Collection of soil and plant samples, extraction of nematodes from soil and roots, killing and fixing of nematodes, staining and separation of nematodes in plants tissue, preparation of temporary and semi-permanent mounts of nematodes, identification of important plant parasitic nematodes, collection and preservation of nematode diseased plant samples; Nematicides and their uses.

Suggested Readings:

1. Reddy, P.P. (1993). A treatise on phyto nematology, Agricol. Publ. Academy, N. Delhi.
2. Walia, R.K. and Bajaj, H.K. (2003). Introduction plant Nematology, ICAR Publication, Krishi Bhawan, New Delhi.
3. Laboratory Manual of Elementary Nematology (Correspondence course No. NEMAT-411) by Dr. R.L. Midha and Dr. G.L. Sharma (2007).
4. डा. गोपाल स्वरूप (1982) पादप कृषि विज्ञान, राजस्थान साहित्य अकादमी, जयपुर।
5. डा. सुशील कुमार एवं डा. बी. पी. सिंह पादप सूत्रकृमि विज्ञान (2003), रामा पब्लिशिंग हाउस, मेरठ।



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STAT-4211

Statistics

3(2+1)

Theory:

Introduction: Definition of statistics by seligman and Horac Secrist. Aims, Scope and limitation of statistics. Classification: Definition and its type (According to attributes and class intervals). Measures of central tendency: A.M., G.M., H.M. median, mode, Properties of A.M. Merits, demerits and uses of above measures. Dispersion: range, M.D. Q.D., S.D., variance and c.v., Merits and demerits of above measures. Correlation and regression: scatter diagram, Karl pearson's correlation coefficient, Simple linear regression; regression lines and their fitting, properties of correlation and regression coefficients. Probability and simple problems based on probability. Test of significance: Null and alternative hypothesis, two types of errors, level of significance, critical region, d.f. standard normal deviate test and students. t-test for single mean and difference between two means, paired t-test. Test of significance of correlation and regression coefficients. Chisquare test for Goodness of fit and for testing independence of attributes, Yates correction (No mathematical derivatives).

Practical:

Preparation of frequency table of quantitative data. Computation of A.M. for raw data and frequency distribution by direct method and short cut method. Computation of G.M. and H.M. for raw data and frequency distribution. Computation of median and mode for raw data and frequency distribution. Computation of M.D.; Q.D. for raw data and frequency distribution. Computation of S.D. and C.V. for raw data and frequency distribution. Computation of correlation coefficient. Estimation of regression lines, t & S.N.D. test for single mean and difference between two means, paired t-test. Test of significance of correlation and regression coefficients. Chisquare test for Goodness of fit & test of independence in 2x2 contingency table and m x n contingency table.

Suggested Readings:

1. Chandel S.R.S. 1998. Handbook of Agril. Statistics. Achal Prakashan Mandir, Kanpur.
2. Gupta S.P. 2002. Statistical Methods. Sultan Chand & Sons, New Delhi.
3. Agarwal B.L. 1991. Basic Statistics Wiley Eastern, New Delhi.

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EXTED-4211 Fundamentals of Rural Sociology and Educational Psychology 2(2+0)

Theory:

Sociology and Rural Sociology-Meaning, Definition, Scope, Importance of rural sociology in Agricultural Extension and Interrelationship between Rural Sociology and Agricultural Extension. Indian Rural Society, Important characteristics, differences & Relationship between Rural and Urban societies. Social Groups: Meaning, Definition, Classification, Factors considered in formation and organization of groups. Social Stratification – Meaning, Definition, Functions, Forms of Social stratification. Cultural concepts - Culture, Customs, Folkways, Mores, Taboos, Rituals and Traditions - Meaning, Definition and their role in Agricultural Extension. Social Values and Attitude - Meaning, Definition, Types and Role of social values and Attitudes in Agricultural Extension. Social Institutions - Meaning, Definition, Major institutions in Rural society, Functions. Social Control - Meaning, Definition, Need and Means of Social control. Social change - Meaning, Definition, Nature of Social change and factors of social change. Leadership- Meaning, Definition, Classification, Roles of Leader, Methods of selection of leaders. Psychology and Educational psychology- Meaning, Definition, Scope and Importance of Educational Psychology in Agricultural Extension. Intelligence - Meaning, Definition, Types, Factors affecting intelligence. Personality- Meaning, Definition, Types, Factors influencing the Personality and Role of Personality in Agricultural Extension. Teaching- Learning process- Meaning and Definition of Teaching, Learning, Learning experience and Learning situation, Elements of learning situation and its characteristics.

Suggested Readings:

1. Bhatia, H.R. 1965. A Text Book of Educational Psychology, Asia Publishing House, New Delhi.
2. Chitamber, J.B., 1990. Introductory Rural Sociology: Willey Easter Ltd. New Delhi.
3. Dahama, O.P. & Bhatnagar, O.P.,1985. Education & Communication for Development,Oxford and IBH Publishing Company, New Delhi,
4. Desai, A.R. 1953. Rural Sociology in India, Vora & Co. Publisher Pvt. Ltd., Bombay.
5. Pujari, D. 2002 Educational Psychology in Agriculture, Agrotech Publishing Academy, Udaipur (Raj.) –313001.

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HORT--4211 Production Technology of Fruit and Plantation Crops

3(2+1)

Theory:

Importance, introduction and scope of horticulture. Classification of fruits according to climate. Selection of site, planning, establishment and layout of orchard. Propagation methods of fruit crops. Methods of training and pruning in fruit crops. Use of growth regulators in fruit production. Package of practices for the cultivation of major fruits with the emphasis on botanical name, family, origin, distribution, climate, soil, varieties, propagation, planting, manures and fertilizers, irrigation, training and pruning, intercultural operation, harvesting, yield and plant protection measures including physiological disorders – mango, banana, citrus, grape, guava, sapota, apple, papaya, pineapple, pomegranate, ber, jack, aonla, bael, date palm; plantation crops -coconut, areca nut, cashew, oil palm and tea

Practical:

Identification of fruit and plantation crops. Study of horticultural tools and implements and their uses; Plant propagation methods, by seeds, cuttings (soft wood, hard wood and semi-hardwood), budding and grafting, layering (simple layering, Air layering.); Layout and planting systems, Methods of pruning and training of important fruit crops. Irrigation methods in fruit crops including drip – Micro irrigation methods for establishment of orchard; Methods of fertilizer application in fruit crops. Visit to local commercial orchards with in state; Preparation of growth regulator solutions for propagation; Application of growth regulators for improving fruit set, fruit size and quality.

Suggested Readings:

1. Bose.T.K., Kabir.J., Das.P. and Joy.P.P.(2000)Tropical Horticulture. Naya Prokash.Calcutta
2. Singh.Amar (1986)Fruit Physiology And Production. Kalyani Publishers,New Delhi
3. Singh. S.P. (1997) Commercial Fruits.Kalyani Publishers,New Delhi
4. Mitra.S.K., Bose. T.K. andRathore.D.S.(1991) Temperate Fruits. Horticulture & Allied Publishers,Calcutta
5. Parthasvathy. V. A. Chattopadhyay. P.K. and Bose. T.K. (2006). Plantation Crpos.Naya Prokash, Kolkatta
6. Bal. J.S. (1997) Fruit Growing. Kalyani Publisher, New Delhi
7. Chandra, Atul and Chandra, Anju Production and Post harvest technology of Fruits. NBS Publisher & Distributers, Bikaner

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AECON- 4211

Production Economics and Farm Management

2 (1+1)

Theory:

Production Economics: Meaning, Definition, Nature and Scope of Agricultural Production Economics. Basic concepts and terms. Concepts of Production. Production Functions: Meaning, Definition, Types. Laws of returns: Increasing, Constant and decreasing. Factor Product Relationship. Determination of optimum input and output. Factor relationship. Product relationship. Types of enterprise relationships. Returns to scale: Meaning, Definition, Importance. Farm Management. Economic principles applied to the Organisations of farm business. Types and systems of farming. Farm planning and budgeting. Risk and uncertainty. Farm budgeting. Linear programming: Assumptions, Advantages and Limitations of Linear programming.

Practical:

Computation of cost concepts; Methods of computation of depreciation; Analysis of Net worth statement; Farm inventory analysis; Preparation of farm plans and budgets; Types of farm records and accounts; Preparation of profit and loss account; Break, Even analysis; Economics analysis of different crop and livestock enterprises; Application of Farm Management Principles.

Suggested Readings:

1. Mittal, S.K. and Sethi, C.P. "Linear Programming."
2. Tandan R.K. and Dhondiyal, S.P. "Principles and Methods of Farm Management".
3. Heady, E.O. and Candler, W. "Linear Programming Methods".
4. Johl, S.S. and Kapoor, T.R. "Fundamental of Farm Business Management, Kalyani Publishers, Ludhiana and New Delhi.
5. Sankhayan, P.L. "Introduction to the Economics of Agricultural Production".
6. Singh, I.J. "Elements of Farm Management".
7. Dorfman, R. and Samuelson and Solow, R. "Linear Programming and Economic Analysis".
8. Heady, E.O. and Dillors, J.L. "Agricultural Production Function".
9. Karam, A.S. and Karan Singh "Economics of Farm Management in India".

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AENGG -4211

Farm Power and Machinery

2(1+1)

Theory :

Sources of farm power; Scope and development of farm mechanization; Elementary knowledge of principle, operation, types and components of I.C. engines; I.C. engine terminology and related numericals. Different systems of I.C. engines- Air supply and exhaust system; Fuel supply system; Lubricating system; Cooling system; Transmission system; Daily and periodic maintenance of tractors; Tractor driving and its safety; Hitching of implements; Numericals on field capacity and draw bar horse power requirements of implements; Primary tillage implements- tractor drawn mould board plough and disk plough; Secondary tillage implements- cultivators, harrows and hoes; Ferti-seed drill- parts and calibration (including numericals).

Practical :

Identification of engine parts; Study of air and fuel supply system; Study of lubricating and cooling system; Study of transmission system; Tractor driving and its safety; Hitching of implements; Daily and periodic maintenance of tractor; Study of tractor drawn mould board plough and disk plough; Study of different cultivators, harrows and hoes; Study and calibration of ferti-seed drill; Estimation of tractor operational cost; Numerical problems on field capacity, field efficiency and power requirement of implements; and numericals on engine terminology.

Suggested Readings:

1. Principles of Agricultural Engineering. Vol. I. 1987. Michael, A.M. and T.P. Ojha. Jain Brothers, Jodhpur.
2. Farm Tractors, Maintenance and Repair. 1989. Rai and Jain. Tata Mc Graw Hill Publ. New Delhi.
3. Elements of Farm Machinery. 1989. Srivastava, A.C. Oxford IBH Publ. Company, New Delhi.
4. Elements of Agricultural Engineering, Vol. I & III. 1989. Singhal, O.P. Suraj Prakashan, Allahabad.
5. Element of Agricultural Engineering. 1990. Sahay, Jagdishwar. Agro. Book Agency, New Chitragupta Nagar, Patna.

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SCHEM-4211

Manures and Fertilizers

2(1+1)

Theory:

Soil organic matter, Composition, Decomposability, C: N ratio. Soil biology, Biomass, Soil organisms and their beneficial and harmful roles. Raw materials – Manures – Bulky and concentrated – FYM, Composts – Different methods, Mechanical compost plants, Vermicomosting, Green manures, Oil cakes, Sewage and sludge – Biogas plant slurry, Plant and animal refuges. Fertilizers – classifications, Chemistry of manufacturing and properties of major nitrogenous (ammonium sulphate, urea, calcium ammonium nitrate, ammonium nitrate, ammonium sulphate nitrate) phosphatic (single super phosphate, enriched super phosphate, diammonium phosphate, ammonium poly phosphate), potassic and complex fertilizers, their fate and reactions in the soil, Secondary and micronutrients fertilizers, amendments, Fertilizer Control Order, Fertilizer storage; Important Biofertilizers and their advantage.

Practical:

Determination of organic carbon and microbial biomass C, N and P. Total nitrogen and phosphorus in manures / composts – Ammoniacal and nitrate nitrogen – Water soluble P_2O_5 , potassium, calcium, sulphur and zinc contents of fertilizers, Adulteration in fertilizer.

Suggested Readings:

1. Yawalkar, K.S. and Agarwal. J.P. (1992). Manure and fertilizers. Agriculture- Horticulture Publishing House, Nagpur.
 2. Tisdale, S.L. and Nelson, W.L. (1990). Soil Fertility and fertilizers, McMillan Pub. Co. N.Y. pp.754.
 3. Sanchalli, V.K. (1960). Chemistry and Technology of Fertilizers. Reinhebl publishing corporation, New York,USA.
 4. Chopra, S.L. and Kanwar, J.S. (1991). Analytical Agriculture, Chemistry, Kalyani Publishers, New Delhi.
 5. Tandon, H.L.S. (1989). Soil water and fertilizers analysis, Fertilizer Development and Consultant organization, New Delhi
 6. FAI. (1999). Fertilizer (Control) Order, 1985 and the essential commodities Act, 1995. FAI, New Delhi, pp. 203.
 7. Kanwar, J.S. (1976). Soil Fertility: theory and practice. (ed) ICAR, New Delhi pp. 583.
 8. McVicker, M.H. (1952). Using commercial fertilizers, Interstate Danvil, US.
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