

Theory

Precision agriculture: concepts and techniques; their issues and concerns for Indian agriculture; Geo-informatics- definition, concepts, tool and techniques; their use in Precision Agriculture. Crop discrimination and Yield monitoring, soil mapping; fertilizer recommendation using geospatial technologies; Spatial data and their management in GIS; Geodesy and its basic principles; Remote sensing concepts and application in agriculture; Image processing and interpretation; Global positioning system (GPS), components and its functions; System Simulation- Concepts and principles, Introduction to crop Simulation Models and their uses for optimization of Agricultural Inputs; STCR approach for precision agriculture; Nanotechnology, definition, concepts and techniques, brief introduction about nanoscale effects, nano-particles, nano-pesticides, nano-fertilizers, nano-sensors, Use of nanotechnology in tillage, seed, water, fertilizer, plant protection for scaling-up farm productivity.

Practical

Introduction to GIS software, spatial data creation and editing. Introduction to image processing software. Visual and digital interpretation of remote sensing images. Generation of spectral profiles of different objects. Supervised and unsupervised classification and acreage estimation. Multispectral remote sensing for soil mapping. Creation of thematic layers of soil fertility based on GIS. Creation of productivity and management zones. Fertilizers recommendations based of VRT and STCR techniques. Crop stress (biotic/abiotic) monitoring using geospatial technology. Use of GPS for agricultural survey. Formulation, characterization and applications of nanoparticles in agriculture. Projects formulation and execution related to precision farming.

Suggested Readings

1. Krishna, K.K. 2013. Precision Farming: Soil Fertility and Productivity Aspects. Apple Academic Press
2. Srivastava, G.S. 2014. An Introduction to Geoinformatics. McGrew Hill Education (India) Pvt. Ltd. , New Delhi
3. Gupta, R.K. and Subhash Chander. 2008. Principles of Geoinformatics. Jain Brothers, New Delhi.
4. Choudhary, S. 2011. Applied Nanotechnology in Agriculture. Arise Publishers & Distributors
5. Sekhon, B.S. 2014. Nanotechnology in agri-food production: an overview. *Nanotechnology, Science and Applications* 7:31-532.

AGRON-312

Practical Crop Production-I (Kharif Crops)

Credit hours 2(0+2)

Practical

Crop planning, raising field crops in multiple cropping systems: Field preparation, seed, treatment, nursery raising, sowing, nutrient, water and weed management and management of insect-pests diseases of crops, harvesting, threshing, drying winnowing, storage and marketing of produce. Seed production, mechanization, resource conservation and integrated nutrient, insect-pest and disease management technologies. Preparation of balance sheet including cost of cultivation, net returns per student as well as per team of 8-10 students.

Suggested Readings

1. Yawalkar, K.S., Agarwal, J.P. and Bokde, S. 2008. Manures and Fertilizers (10th edition), Agri-Horticultural Publishing House, Nagpur.
2. Balasubramaniyan, P. and Palaniappan, S.P. 2001. Principles and Practices of Agronomy Agrobios (India), Jodhpur.
3. Reddy, S. R., 2016. Principles of Agronomy (5th edition), Kalyani Publishers, Ludhiana.
4. Singh, S.S. and Singh, Rajesh. 2015. Principles and Practices of Agronomy (5th Re-set), Kalyani Publishers, New Delhi, Kalyani Publishers, Ludhiana.

Theory:

General account on nature and type of damage by different arthropods pests. Scientific name, order, family, host range, distribution, nature of damage, and management of major pests of various field crop, vegetable crop, fruit crop, plantation crops, ornamental crops, spices and condiments during *kharif*.

Categories of pests. Concept of IPM, Practices, scope and limitations of IPM. Classification of insecticides, toxicity of insecticides and formulations of insecticides. Chemical control-importance, hazards and limitations. Recent methods of pest control, repellents, antifeedants, hormones, attractants, gamma radiation. Insecticides Act 1968-Important provisions. Application techniques of spray fluids. Symptoms of poisoning, first aid and antidotes.

Practical:

Identification of different types of damage. Identification and study of life cycle and seasonal history of various insect pests attacking crops and their produce: (a) Field Crops; (b) Vegetable Crops; (c) Fruit Crops; (d) Spices & condiments during *kharif*. Assessment of losses due to insects. Calculations on the doses of insecticide application technique.

Suggested Readings:

1. David BV and Ramamurthy VV. 2016. *Elements of Economic Entomology*. 8th Edn. Brillion Publ., New Delhi.
2. Dhaliwal GS, Singh R & Chhillar BS. 2006. *Essentials of Agricultural Entomology*. Kalyani Publ., New Delhi.
3. Dunston AP. 2007. *The Insects: Beneficial and Harmful Aspects*. Kalyani Publ., New Delhi
4. Evans JW. 2005. *Insect Pests and their Control*. Asiatic Publ., New Delhi.
5. Nair MRGK. 1986. *Insect and Mites of Crops in India*. ICAR, New Delhi.
6. Atwal AS & Dhaliwal GS. 2002. *Agricultural Pests of South Asia and their Management*. Kalyani Publ., New Delhi.
7. Pedigo LP. 2008. *Entomology and Pest Management*. Phi Learning Publisher.

PPATH-312 Diseases of Field, Horticultural Crops & their Management-I Cr.Hr. 3 (2+1)

Theory

Symptoms, etiology, disease cycle and management of major diseases of following crops:

Field Crops: **Rice:** blast, bacterial blight, sheath blight, khaira and tungro; **Maize:** stalk rots, downy mildew, leaf spots; **Sorghum:** smuts, and anthracnose, **Bajra :**downy mildew, ergot and smut. **Groundnut:** early and late leaf spots, collar rot. **Soybean:** Rhizoctonia root rot, bacterial spot and mosaic; **Pigeonpea:** wilt and sterility mosaic; Black & green gram: Cercospora leaf spot, anthracnose and yellow mosaic; **Castor:** Bacterial blight and wilt; **Tobacco:** mosaic. **Sesame:** phyllody and bacterial spot, Cluster bean: Bacterial leaf blight, Powdery mildew and Alternaria blight, Cotton: Vascular wilt and black arm.

Horticultural Crops: **Guava:** wilt and anthracnose; **Banana:** Panama wilt, bacterial wilt and bunchy top; **Papaya:** Foot rot, leaf curl and ring spot; **Pomegranate:** bacterial blight and Aspergillus rot ;**Brinjal:** Phomopsis blight and little leaf. **Tomato:** damping off, bacterial wilt, early blight, and leaf curl; **Okra:**Yellow Vein Mosaic and Powdery mildew; Ginger: Rhizome rot; **Ber:** Powdery mildew, **Aonla** rust, **Custard** apple: Leaf spots.

Practical

Identification and histopathological studies of selected diseases of field and horticultural crops covered in theory. Field visit for the diagnosis of field problems. Collection and preservation of plant diseased specimens for Herbarium; Note: Students should submit 30 pressed and well-mounted specimens.

Suggested Readings

1. Singh, R.S. Diseases of fruit crops: Oxford & IBH publishing Co. Pvt. Ltd., New Delhi.
2. Cook, A.A. 1981 Diseases of tropical and sub-tropical field, fiber and oil plants: Mac Millan Publishing Co., New York.
3. Rangaswamy, G. and Mahadevan, A. 2001. Diseases of Crop Plants in India: Prentice Hall of India Pvt. Ltd., New Delhi.
4. Sohi, H.S. 1992. Diseases of Ornamental Plants in India. ICAR, New Delhi
5. Singh, R.S. 1998. Plant Diseases: Oxford & IBH publishing Co.,Pvt.Ltd.,New Delhi.
6. Cook, A.A. 1981. Diseases of tropical and sub-tropical field, fiber and oil plants: Mac Millan Publishing Co., New York.
7. Rangaswamy, G and Mahadevan, A. 2001. Diseases of Crop Plants in India: Prentice Hall of India Pvt. Ltd., New Delhi.
8. Gupta, V.K. and Paul, Y.S. (eds.) 2002. Diseases of Field Crops, Indus Publishing Co., New Delhi.
9. Agrios,G.N. 2005 . Plant Pathology: Elsevier Academic Press, New York.

**SSAC-311 MANURES, FERTILIZERS AND SOIL
FERTILITY MANAGEMENT**

CREDIT HOURS 3(2+1)

Theory

Introduction and importance of organic manures, properties and methods of preparation of bulky and concentrated manures. Green/leaf manuring. Soil organic matter, composition, properties and influences of soil fertility, Humic substances – nature and properties.

Chemical fertilizers: classification, specification and properties of major nitrogenous, phosphatic, potassic fertilizers, secondary & micronutrient fertilizers, Complex fertilizers, nano fertilizers Soil amendments, Fertilizer Storage, Fertilizer Control Order.

History of soil fertility and plant nutrition. criteria of essentiality. Forms of nutrients in soil, role, deficiency and toxicity symptoms of essential plant nutrients, Mechanisms of nutrient transport to plants, factors affecting nutrient availability to plants. Soil fertility evaluation, Soil testing. Critical levels of different nutrients in soil. Indicator plants. Methods of fertilizer recommendations to crops. Factor influencing nutrient use efficiency (NUE), Integrated nutrient management.

Practical

Introduction of analytical instruments and their principles, Estimation of soil organic carbon, Estimation of available N in soils. Estimation of soil extractable P in soils. Estimation of exchangeable K; Ca and Mg in soils. Estimation of soil extractable S in soils.. Estimation of DTPA extractable Zn in soils. Estimation of N in plants. Estimation of P in plants. Estimation of K in plants. Estimation of S in plants.

Suggested Readings:

1. Biswas, T.D. and Mukherjee, S.K. (2006) Text book of soil science. Tata McGraw Hill publishing Co. Ltd, New Delhi
2. Das, D.K. (2002) Introductory Soil Science, Kalyani publisher, New Delhi
3. Rai, M.M. (2002) Principal of Soil Science, Mac Millan India Ltd, New Delhi
4. Mehra R.K. (2004) Text book of Soil Science, ICAR New Delhi
5. ISSS (2002) Fundamental of Soil Science Div. of Soil Science, IARI, New Delhi
6. Jackson, M.L. (1973) Soil chemical analysis, Prentice Hall of India, Pvt. Ltd New Delhi
7. Piper, C.S. (1950) Soil and Plant analysis, .Hans publications, Bombay
8. Singh Dhyani, Chhonkar, P.K. and Dwivedi V.S. (2005) Manul on Soil Plant and water analysis. Westville Publishing House, New Delhi
9. Tisdale, S.L. Nelson, W.L. Beaton, J.D. and Havlin, J.L. (1991) Soil fertility and fertilizers (5th ed.). Prentice Hall of India, Pvt. Ltd, New Delhi.
10. Singh Vinay (1996) (Hindi) Soil Science, fertilizer & Manures, V.K. Prakashan Barot Merrut (U.P)
11. Yawalkar, K.S. and Agarwal. J.P. (1992). Manure and fertilizers. Agriculture-Horticulture Publishing House, Nagpur.
12. Sanchalli, V.K. (1960). Chemistry and Technology of Fertilizers. Reinhebl publishing corporation, New York, USA.
13. Chopra, S.L. and Kanwar, J.S. (1991). Analytical Agriculture, Chemistry, Kalyani Publishers, New Delhi.
14. Tandon, H.L.S. (1989). Soil water and fertilizers analysis, Fertilizer Development and Consultant organization, New Delhi

Theory

Categories of insect pests and diseases, IPM: Introduction, history, importance, concepts, principles and tools of IPM. Economic importance of insect pests, diseases and pest risk analysis. Methods of detection and diagnosis of insect pest and diseases. Calculation and dynamics of economic injury level and importance of Economic threshold level. Methods of control: Host plant resistance, cultural, mechanical, physical, legislative, biological and chemical control. Nature, chemical combination, classification, mode of action and formulations of fungicides and antibiotics. Ecological management of crop environment. Introduction to conventional pesticides (BCA, Organics, biopesticides and Botanicals) for the insect pests and disease management. Survey surveillance and forecasting of Insect pest and diseases. Development and validation of IPM module. Implementation and impact of IPM (IPM module for Insect pest and disease. Safety issues in pesticide uses. Political, social and legal implication of IPM. Case histories of important IPM programmes.

Practical

Methods of diagnosis and detection of various insect pests, and plant diseases, Methods of insect pests and plant disease measurement, Assessment of crop yield losses, calculations based on economics of IPM, Identification of biocontrol agents, different predators and natural enemies. Mass multiplication of *Trichoderma*, *Pseudomonas*, *Trichogramma*, NPV etc. Identification and nature of damage of important insect pests and diseases and their management.

Suggested Readings

1. David, B.V. 2000. Elements of Entomology. CAB Publications, Chennai.
2. Dhaliwal, G.S. and E.A. Heinrichs. 1998. Critical issues in pest management. Commonwealth Publishers, New Delhi. 287 p.
3. Dhaliwal, G.S. and Ramesh Arora 2002. Integrated Pest Management – Concept and Approaches. Kalyani Publishers, New Delhi, 297 p.
4. Pradhan, S. 1983. Agricultural Entomology and Pest Control. Indian Council of Agricultural Research, New Delhi, 267 p.
5. Pedigo, L.P. 2002. Entomology and Pest Management. Prentice hall of India, New Delhi.
6. Metcalf, R.L. and Luckmann, W.H. 1982. Introduction of Insect Pest Management. A Wiley – Interscience Publication, 561 p.
7. Gupta VK & Sharma RC. (Eds). 1995. Integrated Disease Management and Plant Health. Scientific Publ., Jodhpur.
8. Mayee CD, Manoharachary C, Tilak KVBR, Mukadam DS & Deshpande Jayashree (Eds.). 2004. Biotechnological Approaches for the Integrated Management of Crop Diseases. Daya Publ. House, New Delhi.
9. Sharma, R.C. and Sharma J.N. (Eds). 1995. Integrated Plant Disease Management. Scientific Publ., Jodhpur.

PBG-311 Crop Improvement – I (*Kharif*) 2(1+1)

Theory

Centers of origin, distribution of species, wild relatives in different cereals; pulses; oilseeds; fibres; fodders and cash crops; vegetable and horticultural crops; Plant genetic resources, its utilization and conservation Floral biology, study of genetics of qualitative and quantitative characters; Important concepts of breeding self pollinated, cross pollinated and vegetatively propagated crops; Major breeding objectives and procedures including conventional and modern innovative approaches for development of hybrids and varieties for yield, adaptability, stability, abiotic and biotic stress tolerance and quality (physical, chemical, nutritional); Seed production technology in self pollinated, cross pollinated and vegetatively propagated crops.

Cereals: Rice, maize, sorghum and bajra

Pulses: Urd, mung, cowpea, pigeonpea and moth bean

Oilseeds: Soybean, sesame and groundnut

Fibre crops: Cotton

Fodder: Bajra, sorghum, maize

Vegetables: Chilli and tomato

Cash/ other crops: Castor

Hybrid seed production technology in Maize, Rice, Sorghum, Pearl millet and Pigeonpea, etc. Ideotype concept and climate resilient crop varieties for future.

Practical

Emasculation and hybridization techniques in different crop species; viz., Rice, Maize, Sorghum, Pearl Millet, Pigeonpea, Urdbean, Mungbean, Soybean, Groundnut, Sesame , Castor, Cotton, Cowpea and Pearl millet. Maintenance breeding of different kharif crops. Handling of germplasm and segregating populations by different methods like pedigree, bulk and single seed decent methods; Study of field techniques for seed production and hybrid seeds production in *Kharif* crops; Estimation of heterosis, inbreeding depression and heritability; Layout of field experiments; Study of quality characters, donor parents for different characters; Visit to seed production plots; Visit to AICRP plots of different field crops.

EXT 311

Entrepreneurship 2(1+1)
Development and Business
Communication

Theory

Part – I

Concept of Entrepreneur, Entrepreneurship Development: Concept and Meaning. Characteristics of entrepreneurs; SWOT Analysis & achievement motivation, Government policy and programs and institutions for entrepreneurship development, Impact of economic reforms on Agribusiness/ Agri-enterprises, Entrepreneurial Development Process; Business Leadership Skills;

Part – II

Developing organizational skill (controlling, supervising, problem solving, monitoring & evaluation), Developing Managerial skills, Business Leadership Skills (Communication, direction and motivation Skills), Problem solving skill, Supply chain management and Total quality management, Project Planning Formulation and report preparation; Financing of enterprise, Opportunities for agri-entrepreneurship and rural enterprise.

Practical

Assessing entrepreneurial traits, Practice on SWOT analysis, Practicing problem solving skills, managerial skills and achievement motivation, exercise in creativity, time audit through planning, monitoring and supervision, identification and selection of business idea, preparation of business plan and proposal writing, visit to entrepreneurship development institute and interaction with entrepreneurs.

PBG-312

Intellectual Property Rights

1(1+0)

Theory

Introduction and meaning of intellectual property, brief introduction to GATT, WTO, TRIPs and WIPO, Treaties for IPR protection: Madrid protocol, Berne Convention, Budapest treaty, etc. Types of Intellectual Property and legislations covering IPR in India:-Patents, Copyrights, Trademark, Industrial design, Geographical indications, Integrated circuits, Trade secrets. Patents Act 1970 and Patent system in India, patentability, process and product patent, filing of patent, patent specification, patent claims, Patent opposition and revocation, infringement, Compulsory licensing, Patent Cooperation Treaty, Patent search and patent database. Origin and history including a brief introduction to UPOV for protection of plant varieties, Protection of plant varieties under UPOV and PPV&FR Act of India, Plant breeders rights, Registration of plant varieties under PPV&FR Act 2001, breeders, researcher and farmers rights. Traditional knowledge-meaning and rights of TK holders. Convention on Biological Diversity, International treaty on plant genetic resources for food and agriculture (ITPGRFA). Indian Biological Diversity Act, 2002 and its salient features, access and benefit sharing.

HORT-311

Landscaping

3(2+1)

Theory

Importance and scope of landscaping. Principles of landscaping, garden styles and types, terrace gardening, vertical gardening, garden components, adornments, rockery, water garden, walk-paths, bridges, other constructed features etc. gardens for special purposes. Trees: selection, propagation, planting schemes, canopy management, shrubs and herbaceous perennials: selection, propagation, planting schemes, architecture. Climber and creepers: importance, selection, propagation, planting, Annuals: selection, propagation, planting scheme, Other garden plants: palms, ferns, grasses and cacti succulents and shade loving plants. Pot plants: selection, arrangement, management. Bio-aesthetic planning: definition, need, planning; landscaping of urban and rural areas, Peri-urban landscaping (roof garden), Landscaping of schools, public places like bus station, railway station, townships, river banks, hospitals, play grounds, airports, industries, institutions. Bonsai: principles and management, lawn: establishment and maintenance. CAD application.

Practical

Identification of trees, shrubs, annuals, pot plants; Propagation of trees, shrubs and annuals, care and maintenance of plants, shrubs and trees, potting and repotting, identification of tools and implements used in landscape design, training and pruning of plants for special effects, lawn establishment and maintenance, layout of formal gardens, informal gardens, special type of gardens (sunken garden, terrace garden, rock garden) and designing of conservatory and lath house. Use of computer software, visit to important gardens/ parks/ institutes.

Theory

Introduction to agricultural waste management, Nature and characteristics of agricultural waste and their impact on the environment, Kinds of wastes, Classification, role of soil and plants in waste management, sources of waste, impact of waste on soil and plant quality, Biological processes of waste management, Utilization and Recycling of Agricultural waste, Potential of Recyclable Crop Residues and its management, In-situ management of agriculture waste, Composting and Vermicomposting for bio conservation of biodegradable waste, Biogas Technology, Agricultural waste and water, air and animal resources, Impacts of waste on human, animal health and environment. Management of bedding & litter, wasted feed, run-off from feed lots and holding areas and waste water from dairy parlors, agro-waste recycling through farming system, waste management machineries, environmental benefit of waste management.

Practical

Collection and preparation agricultural waste sample. Determination of pH, EC, CECe, heavy metals, BOD, COD, TSS, TDS, NH₄, Total P, and dissolved reactive P. Nutrient status (N, P, K, secondary and micronutrients) analysis of agricultural waste. Waste management equipment operation, Maintenance and safety hazards, computer software and models. Survey of different agri waste from live stock, dairy, poultry, food processing, fruit & vegetable and agri-chemicals, Preparation of compost, Vermicomposting, biogas and analysis of compost.

Suggested Readings

1. Sannigrahi, A.K. 2011. Agriculture and Waste Management for Future Sustainable Future, New India Publishing Agency, New Delhi.
2. Loehr, R.C. 2012. Agricultural Waste Management: Problems, Processes, and Approaches, Academic Press Inc..
3. NAAS. 2010. "Agricultural Waste Management" Policy Paper 49, National Academy of Agricultural Sciences, New Delhi.
4. Sanjay Kumar. 2013. Fundamentals of Renewal Energy Resources and Technology. Kalyani Publishers, New Delhi.
5. Panda, H. 2013. The Complete Book on Biological Waste Treatment and their Utilization, NIIR Project Consultancy Services, New Delhi.
6. IARI. 2012. Crop residues management with conservation agriculture: Potential, constraints and policy needs. Indian Agricultural Research Institute, New Delhi.

Theory

History and concept of biopesticides. Importance, scope and potential of biopesticide. Definitions, concepts and classification of biopesticides viz. pathogen, botanical pesticides, and biorationales. Botanicals and their uses. Mass production technology of bio-pesticides. Virulence, pathogenicity and symptoms of entomopathogenic pathogens and nematodes. Methods of application of biopesticides. Methods of quality control and Techniques of biopesticides. Impediments and limitation in production and use of biopesticide.

Biofertilizers - Introduction, status and scope. Structure and characteristic features of bacterial biofertilizers- *Azospirillum*, *Azotobacter*, *Bacillus*, *Pseudomonas*, *Rhizobium* and *Frankia*; Cyanobacterial biofertilizers- *Anabaena*, *Nostoc*, *Hapalosiphon* and fungal biofertilizers- AM mycorrhiza and ectomycorrhiza. Nitrogen fixation -Free living and symbiotic nitrogen fixation. Mechanism of phosphate solubilization and phosphate mobilization, K solubilization. Production technology: Strain selection, sterilization, growth and fermentation, mass production of carrier based and liquid biofertiizers. FCO specifications and quality control of biofertilizers. Application technology for seeds, seedlings, tubers, sets etc. Biofertilizers -Storage, shelf life, quality control and marketing. Factors influencing the efficacy of biofertilizers.

Practical

To study about mass production technology of important biopesticides. Identification of important botanicals. Visit to biopesticide lab. working in nearby area. Field visit to explore naturally infected cadavers. Identification of entomopathogenic entities in field condition. Quality control of biopesticides.

Isolation and purification of *Azospirillum* , *Azotobacter*, *Rhizobium*, P-solubilizers and cyanobacteria. Mass multiplication and inoculums production of biofertilizers. Isolation of AM fungi -Wet sieving method and sucrose gradient method. Mass production of AM inoculants.

Suggested Reading:

1. Motsara, M.R., Bhattacharyya, P. and Srivastava, Beena. 1995. Biofertilizer Technology, Marketing and Usage. *A Sourcebook-cum-Glossary. Fertiliser Development and Consultation Organisation, 204-204A Bhanot Corner, 1-2 Pamposh Enclave, New Delhi 110048 (India).*
2. Sandhu, S.S. 2013. Biofertilizer Technology. Blabk Prints, New Delhi-110002.
3. Bhattacharyya, P. and Tandon, H.L.S. 2012. Biofertiliser Handbook-Research-Production-Application. *Fertiliser Development and Consultation Organisation, 204-204A Bhanot Corner, 1-2 Pamposh Enclave, New Delhi 110048 (India).*
4. Sharma, A.K. 2004. Biofertilizers for Sustainable Agriculture, Agrobios (India).
5. Leo M.L. Nollet and Hamir Singh Rathore. 2015. Biopesticides Handbook. CRC Press.
6. Nutan Kaushik. Biopesticides for Sustainable Agriculture: Prospects and Constraints. <http://bookstore.teri.res.in/books>.

ELECTIVE COURSES

AGECON- 311 Agri-business Management

Credit hours: 3(2+1)

Theory

Transformation of agriculture into agribusiness, various stakeholders and components of agribusiness systems. Importance of agribusiness in the Indian economy and New Agricultural Policy. Distinctive features of Agribusiness Management: Importance and needs of agro-based industries, Classification of industries and types of agro based industries. Institutional arrangement, procedures to set up agro based industries. Constraints in establishing agro-based industries. Agri-value chain: Understanding primary and support activities and their linkages. Business environment: PEST & SWOT analysis. Management functions: Roles & activities, Organization culture. Planning, meaning, definition, types of plans. Purpose or mission, goals or objectives, Strategies, policies procedures, rules, programs and budget. Components of a business plan, Steps in planning and implementation. Organization, staffing, directing and motivation. Ordering, leading, supervision, communications, control. Capital Management and Financial management of Agribusiness. Financial statements and their importance. Sales & Distribution Management. Pricing policy, various pricing methods. Project Management definition, project cycle, identification, formulation, appraisal, implementation, monitoring and evaluation. Project Appraisal and evaluation techniques.

Practical

Study of agri-input markets: Seed, fertilizers, pesticides. Study of output markets: grains, fruits, vegetables, flowers. Study of product markets, retails trade commodity trading, and value added products. Study of financing institutions- Cooperative, Commercial banks, RRBs, Agribusiness Finance Limited, NABARD. Preparations of projects and Feasibility reports for agribusiness entrepreneur. Case study of agro-based industries. Trend and growth rate of prices of agricultural commodities. Appraisal/evaluation techniques of identifying viable project- discounted and non-discounting techniques.

Suggested reading:

1. G. L. Meena, S. S. Burark, D. C. Pant and Rajesh Sharma, 2017. Fundamentals of Agribusiness Management, Agrotech Publishing Academy, Udaipur, ISBN: 978-81-8321-418-6. First edition.
2. Gittinger, J.P, 1984, Economic Analysis of Agricultural Projects, John Hopkins University Press.
3. Kotler, Philip, 1999, Marketing Management, Prentice Hall of India, New Delhi,
4. L.L. Somani and G. L. Meena, 2017. Agribusiness & Farm Management at a Glance, Vol-2, Basic & Applied Fundamentals, Agrotech Publishing Academy, Udaipur, ISBN: 978-81-8321-429-2. Second edition.
5. Mamoria, C. B., Joshi, R. L. and Mulla, N. I. 2005, Principles and Practices of Marketing in India, Kitab Mahal, Allahabad.
6. Sudha, G.S, 2000, Business Management, RBSA Publishers, Jaipur.
7. Tripathi, P. C. and Reddy, P. N, Principles of Management, Tata McGraw Hill Education Private Limited, New Delhi, 2008.