

**MRSPTU B.SC. (HONS.) AGRICULTURE SYLLABUS
2019 BATCH ONWARDS**

Total Credits= 22

Semester V		Contact Hours			Max Marks		Total Marks	Credits
Subject Code	Subject Name	L	T	P	Int.	Ext.		
BAGRS1-551	Principles of Integrated Pest and Disease Management	2	0	0	40	60	100	2
BAGRS1-552	Manures, Fertilizers and Soil Fertility Management	2	0	0	40	60	100	2
BAGRS1-553	Pests of Crops and Stored Grain and their Management	2	0	0	40	60	100	2
BAGRS1-554	Diseases of Field and Horticultural Crops and their Management -I	2	0	0	40	60	100	2
BAGRS1-555	Crop Improvement-I (<i>Kharif Crops</i>)	1	0	0	40	60	100	1
BAGRS1-556	Entrepreneurship Development and Business Communication	1	0	0	40	60	100	1
BAGRS1-557	Geoinformatics and Nano-technology and Precision Farming	1	0	0	40	60	100	1
BAGRS1-558	Intellectual Property Rights	1	0	0	40	60	100	1
BAGRS1-559	Principles of Integrated Pest and Disease Management Lab	0	0	2	20	30	50	1
BAGRS1-560	Manures, Fertilizers and Soil Fertility Management Lab	0	0	2	20	30	50	1
BAGRS1-561	Pests of Crops and Stored Grain and their Management Lab	0	0	2	20	30	50	1
BAGRS1-562	Diseases of Field and Horticultural Crops and their Management -I Lab	0	0	2	20	30	50	1
BAGRS1-563	Crop Improvement-I (<i>Kharif Crops</i>) Lab	0	0	2	20	30	50	1
BAGRS1-564	Entrepreneurship Development and Business Communication Lab	0	0	2	20	30	50	1
BAGRS1-565	Geoinformatics and Nano-technology and Precision Farming Lab	0	0	2	20	30	50	1
ELECTIVE								
XXXXXX	Landscaping/ System Simulation and Agroadvisory/ Protected Cultivation/ Micro propagation Technologies	2	0	0	40	60	100	2
XXXXXX	Landscaping/ System Simulation and Agroadvisory/ Protected Cultivation/ Micro propagation Technologies Lab	0	0	2	20	30	50	1
Total		14	0	16	520	780	1300	22

Electives:

1. Landscaping: **BAGRD1-571**
2. System Simulation and Agroadvisory: **BAGRD1-572**
3. Protected Cultivation: **BAGRD1-573**
4. Micro propagation Technologies- **BAGRD1-574**

Electives Lab:

1. Landscaping Lab: **BAGRD1-575**
2. System Simulation Agroadvisory Lab: **BAGRD1-576**
3. Protected Cultivation Lab: **BAGRD1-577**
4. Micro propagation Technologies Lab- **BAGRD1-578**

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Total Credits= 22

Semester VI		Contact Hours			Max Marks		Total Marks	Credits
Subject Code	Subject Name	L	T	P	Int.	Ext.		
BAGRS1-651	Rainfed Agriculture & Watershed Management	1	0	0	40	60	100	1
BAGRS1-652	Protected Cultivation and Secondary Agriculture	1	0	0	40	60	100	1
BAGRS1-653	Diseases of Field and Horticultural Crops and their Management-II	2	0	0	40	60	100	2
BAGRS1-654	Post-harvest Management and Value Addition of Fruits and Vegetables	1	0	0	40	60	100	1
BAGRS1-655	Management of Beneficial Insects	1	0	0	40	60	100	1
BAGRS1-656	Crop Improvement-II (<i>Rabi crops</i>)	1	0	0	40	60	100	1
BAGRS1-657	Principles of Organic Farming	1	0	0	40	60	100	1
BAGRS1-658	Farm Management, Production & Resource Economics	1	0	0	40	60	100	1
BAGRS1-659	Principles of Food Science and Nutrition	2	0	0	40	60	100	2
BAGRS1-660	Rainfed Agriculture & Watershed Management Lab	0	0	2	20	30	50	1
BAGRS1-661	Protected Cultivation and Secondary Agriculture Lab	0	0	2	20	30	50	1
BAGRS1-662	Diseases of Field and Horticultural Crops and their Management-II Lab	0	0	2	20	30	50	1
BAGRS1-663	Post-harvest Management and Value Addition of Fruits and Vegetables Lab	0	0	2	20	30	50	1
BAGRS1-664	Management of Beneficial Insects Lab	0	0	2	20	30	50	1
BAGRS1-665	Crop Improvement-II (<i>Rabi crops</i>) Lab	0	0	2	20	30	50	1
BAGRS1-666	Principles of Organic Farming Lab	0	0	2	20	30	50	1
BAGRS1-667	Farm Management, Production & Resource Economics Lab	0	0	2	20	30	50	1
ELECTIVE								
XXXXX	Hi-tech. Horticulture/ Agricultural Journalism/ Food Safety and Standards/ Agri-business Management	2	0	0	40	60	100	2
XXXXX	Hi-tech. Horticulture/ Agricultural Journalism/ Food Safety and Standards/ Agri-business Management Lab	0	0	2	20	30	50	1
Total		13	0	18	580	870	1450	22

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Electives:

1. Hi-tech. Horticulture: **BAGRD1-671**
2. Agricultural Journalism: **BAGRD1-672**
3. Food Safety and Standards: **BAGRD1-673**
4. Agri-business Management: **BAGRD1-674**

Electives Lab:

1. Hi-tech. Horticulture Lab: **BAGRD1-675**
2. Agricultural Journalism Lab: **BAGRD1-676**
3. Food Safety and Standards Lab: **BAGRD1-677**
4. Agri-business Management Lab: **BAGRD1-678**

Overall Marks / Credits

Semester	Marks	Credits
V	1300	22
VI	1450	22
Total	2750	44

**MRSPTU B.SC. (HONS.) AGRICULTURE SYLLABUS
2019 BATCH ONWARDS**

PRINCIPLES OF INTEGRATED PEST AND DISEASE MANAGEMENT

Subject Code: BAGRS1-551

L T P C

Duration: 30 (Hrs.)

2 0 0 2

Course Outcomes:

1. To aware students about various insect and pest of agriculture.
2. To familiarize students with agricultural insects.
3. To create awareness about biological analysis of insects and implementation of strategies for successful pest management

Course Outcomes:

1. Providing knowledge about various types of insects and pests in agriculture.
2. Students will able to recognise the agricultural important insects.
3. The students will be able to examine insects deeply up to biological level of analysis and make different strategies for successful pest management.

Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		1										
CO2				3								
CO3				2								

UNIT-I (7 Hours)

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.

UNIT-II (7 Hours)

Methods of detection and diagnosis of insect pest and diseases. Calculation and dynamics of economic injury level and importance of Economic threshold level.

UNIT-III (8 Hours)

Methods of control: Host plant resistance, cultural, mechanical, physical, legislative, biological and chemical control. Ecological management of crop environment. Introduction to conventional pesticides for the insect pests and disease management. Survey surveillance and forecasting of Insect pest and diseases

UNIT-IV (8 Hours)

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. Case histories of important IPM programmes.

Recommended Text Books / Reference Books:

1. Singh RS. 2013. Introduction to Principles of Plant Pathology. Oxford and IBH Co., New Delhi.
2. Pathak, V. N. Essentials of plant pathology. Prakash Pub., Jaipur
3. Agrios, G. N. Plant Pathology. 5th edition, Published by a division of Reed Elsevier India Pvt., Ltd., New Delhi (2005)
4. Kamat, M. N. Introductory Plant Pathology. Prakash Pub, Jaipur
5. Stakman EC & Harrar JG. 1957. Principles of Plant Pathology. Ronald Press, USA.
6. Tarr SAJ. 1964. The Principles of Plant Pathology. McMillan, London.
7. Vander Plank, JE. 1975. Principles of Plant Infection. Acad. Press
8. Verma JP, Varma A & Kumar D. (Eds). 1995. Detection of Plant Pathogens and their Management. Angkor Publ., New Delhi
9. Mehrotra RS & Aggarwal A. 2003. Plant Pathology. 2nd Ed. Oxford & IBH,

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10. Dhingra OD & Sinclair JB. 1986. Basic Plant Pathology Methods. CRC Press
11. Fox RTV. 1993. Principles of Diagnostic Techniques in Plant Pathology. CABI Nene YL & Thapliyal PN. 1993. Fungicides in Plant Disease Control. Oxford & IBH, New Delhi.
12. Palti J. 1981. Cultural Practices and Infectious Crop Diseases. Springer- Verlag, New York.
13. Vyas SC. 1993 Handbook of Systemic Fungicides. Vols. I-III. Tata McGraw

MANURES, FERTILIZERS AND SOIL FERTILITY MANAGEMENT

Subject Code: BAGRS1-552

L T P C

Duration: 30 (Hrs.)

2 0 0 2

Course Outcomes:

1. To familiarize students with different manures and fertilizers
2. To aware students about different fates of fertilizers.
3. To develop ability of students in evaluating soil fertility and nutrient uptake by plants

Course Outcomes:

1. Providing knowledge about different types of manures and fertilizers and their application.
2. Providing knowledge about the different fates of fertilizers.
3. Students will able to evaluate fertility of soil and plant nutrients uptake.

Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1											
CO2		2										
CO3		2										

UNIT-I (6 Hours)

Introduction and importance of organic manures, properties and methods of preparation of bulky and concentrated manures. Green/leaf manuring. Fertilizer recommendation approaches. Integrated nutrient management

UNIT-II (6 Hours)

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

UNIT-III (8 Hours)

History of soil fertility and plant nutrition. criteria of essentiality. role, deficiency and toxicity symptoms of essential plant nutrients, Mechanisms of nutrient transport to plants, factors affecting nutrient availability to plants

UNIT-IV (10 Hours)

Chemistry of soil nitrogen, phosphorus, potassium, calcium, magnesium, sulphur and micronutrients. Soil fertility evaluation, Soil testing. Critical levels of different nutrients in soil. Forms of nutrients in soil, plant analysis, rapid plant tissue tests. Indicator plants. Methods of fertilizer recommendations to crops. Factor influencing nutrient use efficiency (NUE), methods of application under rainfed and irrigated conditions.

Recommended Text Books / Reference Books:

1. Mariakulandi and Manickam: 1975 : Chemistry of fertilizers and manures.
2. Mariakulandi and Manickam (1975) : Chemistry of manures an fertilizers
3. Tandon H. L. S. (1994) : Recycling of crop, animal, human and industrial Wastes in Agriculture. FDCO, Delhi Krishna and Murthy (1978) : Manual on compost and other organic manures .
4. Rakshit A. 2015.Manures Fertilizers and Pesticides Paperback – Import. CBS Publishing; 1ST edition, pp. 266.

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PESTS OF CROPS AND STORED GRAINS AND THEIR MANAGEMENT

Subject Code: BAGRS1-553

L T P C

Duration: 30 (Hrs.)

2 0 0 2

Course Outcomes:

1. To aware students about various types of insects and pests
2. To familiarize students with families families and orders of class Insecta and economic losses caused by them
3. To develop ability for identification of agriculturally important insect-pest based on morphological characteristics, feeding habit and habitat

Course Outcomes:

1. Providing knowledge about various types of insects and pests in agriculture.
2. To be able to understand about different families and orders of class Insecta which cause economic losses for human beings.
3. To be able to identify morphological characteristics, feeding habit and habitat of agriculturally important insect-pest.

Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		2										
CO2				3								
CO3		3										

UNIT-I (6 Hours)

General account on nature and type of damage by different arthropods pests. Scientific name, order, family, host range, distribution, biology and bionomics

UNIT-II (9 Hours)

Nature of damage, and management of major pests and scientific name, order, family, host range, distribution, nature of damage and control practice other important arthropod pests of various Insect pests of cotton: Cotton jassid, whitefly, aphid, spotted bollworm, pink boll worm, American bollworm, tobacco caterpillar, mealy bug, red cotton bug, dusky cotton bug, grey weevil.
Insect pests of sugarcane: Early shoot borer, top borer, Gurdaspur borer, stalk borer, pyrilla, whitefly, black bug and mealy bug.
Insect pests of rice: Stem borer, rice leaf folder, white backed planthopper, brown plant hopper, rice hispa, rice bug.
Insect pests of wheat, maize and sorghum: Wheat aphid, army worm, maize borer, Pink stem borer, sorghum shoot fly.
Insect pests of pulses: gram cut worm, gram pod borer, lentil pod borer, tur pod fly, pea leaf miner, pea green aphid, pea blue butterfly, bean thrips, red hairy caterpillar, Bihar hairy caterpillar, spotted pod borer and blister beetle.
Insect pests of brinjal and okra: brinjal hadda, brinjal shoot and fruit borer, cotton jassid, cotton whitefly, spotted bollworms.
Insect pests of cruciferous and cucurbitaceous vegetables: cabbage butterfly, diamond back moth, cabbage semilooper, cabbage head borer, mustard aphid, mustard sawfly, painted bug, red pumpkin beetle, melon fruit fly.

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Insect pests of tomato, potato and onion: tomato fruit borer, potato tuber moth, whitefly, onion thrips, onion maggot.
 Insect pests of mango: mango hopper, mealy bug, mango stem borer, bark eating caterpillar, fruit fly.
 Insect pests of citrus: citrus caterpillar, leaf miner, citrus psylla, whitefly, fruit sucking moth.
 Insect pests of grapevine and cashew: grapevine leaf hopper, thrips, leaf roller, cashew tree borer, cashew leaf miner.
 Insect pests of banana and pomegranate: banana scale moth, banana weevil, anar butterfly.

UNIT-III (6 Hours)

Insect pests of chillies, garlic, turmeric, ginger, coriander, spices and condiments : chilli thrips, whitefly, castor capsule borer, Bihar hairy caterpillar, cardamom thrips, pollu beetle.

Insect pests of oilseeds (mustard, sunflower, groundnut, castor): mustard aphid, mustard saw fly, painted bug, leaf miner, Bihar hairy caterpillar, green peach aphid, cabbage semilooper, tobacco caterpillar, sesamum leaf webber, sunflower head borer, tobacco caterpillar, cutworms. groundnut aphid, white grub, castor capsule borer, castor hairy caterpillar

Factors affecting losses of stored grain and role of physical, biological, mechanical and chemical factors in deterioration of grain.

UNIT-IV (9 Hours)

Insect pests, mites, rodents, birds and microorganisms associated with stored grain and their management. Storage structure and methods of grain storage and fundamental principles of grain store management.

Recommended Text Books / Reference Books:

1. A.S. Atwal and G.S. Dhaliwal :Agricultural Pests of South Asia and their Management
2. B.V. David and V.V. Rammurthy: Elements of Economic Entomology
3. Manishekharan and Sudarajan : Pest Management in Field Crops.
4. Pedigo L.P. : Entomology and Pest Management.
5. VenuGopal Rao: Insect Pest Management.
6. B.P. Khare : Storage Entomology

DISEASES OF FIELD & HORTICULTURAL CROPS & THEIR MANAGEMENT-I

Subject Code: BAGRS1-554	L T P C	Duration: 30 (Hrs.)
	2 0 0 2	

Course Objectives:

1. To make students able in recognizing the various diseases of horticultural crops.
2. To aware students about causes of diseases and their symptoms
3. To encourage them to use economical and environmentally friendly techniques for management of diseases

Course Outcomes:

1. To be able to recognise the various diseases of horticultural crops.
2. Students study about the causes of these diseases and their symptoms, which aids in the identification of diseases in horticultural and field crops.
3. Management techniques that are both economical and environmentally friendly can be used.

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Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		1										
CO2		2										
CO3							3					

UNIT-I (7 Hours)

Symptoms, etiology, disease cycle and management of major diseases of following crops:
Field Crops: Rice: blast, brown spot, bacterial blight, sheath blight, false smut, khaira and tungro; Maize: stalk rots, downy mildew, leaf spots; Sorghum: smuts, grain mold and anthracnose,

UNIT-II (8 Hours)

Bajra :downy mildew and ergot; Groundnut: early and late leaf spots, wilt
Soybean: Rhizoctonia blight, bacterial spot, seed and seedling rot and mosaic; Pigeonpea: Phytophthora blight, wilt and sterility mosaic; Finger millet: Blast and leaf spot; black & green gram: Cercospora leaf spot and anthracnose, web blight and yellow mosaic, Castor: Phytophthora blight; Tobacco: black shank, black root rot and mosaic

UNIT-III (7 Hours)

Horticultural Crops: Guava: wilt and anthracnose; Banana: Panama wilt, bacterial wilt, Sigatoka and bunchy top; Papaya: foot rot, leaf curl and mosaic, Pomegranate: bacterial blight;

UNIT-IV (8 Hours)

Cruciferous vegetables: Alternaria leaf spot and black rot; Brinjal: Phomopsis blight and fruit rot and Sclerotinia blight; Tomato: damping off, wilt, early and late blight, buck eye rot and leaf curl and mosaic; Okra: Yellow Vein Mosaic; Beans: anthracnose and bacterial blight; Ginger: soft rot; Colocasia: Phytophthora blight, Tea - blister blight; Coffee – rust.

Recommended Text Books / Reference Books:

1. Agrios, GN. 2010. Plant Pathology. Acad. Press
2. Diseases of Horticultural Crops fruits (1999) By Verma L.R and Sharma R.c, Indus Publishing company, New Delhi
3. Diseases of fruit crops (1986) By V.N.Pathak ,Oxford & IBH publication, New Delhi
4. Diseases of fruit crops (1986) By R.S.Singh ,Oxford & IBH publication, New Delhi
5. Diseases of Fruits and vegetables (2007) S.A.M.H. Naqvi, Springer Science & Business Media
6. Diseases of Plantation Crops (2014) By P.Chowdappa, Pratibha Sharma IPS 263pp
7. Diseases of Horticulture Crops and their management ,ICAR e-book for B.Sc.(Agri) & B.Tech (Agri) By TNAU pp172
8. Advances in the diseases of Plantation crops & spices (2004) P.Santha Kumari, International Book Distributing Company

**MRSPTU B.SC. (HONS.) AGRICULTURE SYLLABUS
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CROP IMPROVEMENT – I (KHARIF CROPS)

Subject Code: BAGRS1-555

L T P C

Duration: 15 (Hrs.)

1 0 0 1

Course Objectives:

1. To make students aware about the wild relatives and their value in developing unique kharif crop varieties.
2. To develop ability in students to learn about techniques used for the preservation of genetic material for use in kharif crop improvement.
3. To familiarize students about the breeding techniques used to enhance kharif crops.

Course Outcomes:

1. Learners know the value of wild relatives in developing unique kharif crop varieties.
2. The student learns how to preserve genetic material for use in kharif crop improvement.
3. The student learns how to use breeding techniques to enhance kharif crops.

Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			1									
CO2					2							
CO3				1								

UNIT-I (4 Hours)

Centers of origin, distribution of species, wild relatives in different cereals; pulses; oilseeds; fibres; fodders and cash crops; vegetable and horticultural crops

UNIT-II (4 Hours)

Plant genetic resources, its utilization and conservation, study of genetics of qualitative and quantitative characters; Important concepts of breeding self pollinated, cross pollinated and vegetatively propagated crops

UNIT-III (3 Hours)

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)

UNIT-IV (4 Hours)

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

Recommended Text Books / Reference Books:

1. Crop Breeding and Biotechnology, HariHar Ram KalyaniPublication, New Delhi.
2. Breeding of Asian Field crops D. A. Sleper J.M., Poehlman ,Blackwell Publishers
3. Principle and Procedures of Plant Breeding Biotechnological and Conventional Approach, G. S. Chahal, S. S. Gosla Narosa Publishers House. New Delhi.

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ENTREPRENEURSHIP DEVELOPMENT AND BUSINESS COMMUNICATION

Subject Code: BAGRS1-556

L T P C

Duration: 15 (Hrs.)

1 0 0 1

Course Outcomes:

1. To make students familiar with business environment.
2. To aware students about entrepreneurial tactics.
3. To enable students in developing business plan.

Course Outcomes:

1. Identify business prospects by analysing the business environment.
2. Analyze the efficiency of various entrepreneurial tactics.
3. Making sense of their own business plan

Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2											
CO2					2							
CO3											2	

UNIT-I (3 Hours)

Concept of Entrepreneur, Entrepreneurship Development, Characteristics of entrepreneurs; Impact of economic reforms on Agribusiness/ Agrienterprises

UNIT-II (3 Hours)

SWOT Analysis & achievement motivation, Government policy and programs and institutions for entrepreneurship development

UNIT-III (6 Hours)

Entrepreneurial Development Process; Business Leadership Skills; Developing organizational skill (controlling, supervising, problem solving, monitoring & evaluation), Developing Managerial skills, Business Leadership Skills (Communication, direction and motivation Skills), Problem solving skill

UNIT-IV (3 Hours)

Supply chain management and Total quality management, Project Planning Formulation and report preparation; Financing of enterprise, Opportunities for agripreneurship and rural enterprise

Recommended Text Books / Reference Books:

1. Akhouri, M.M.P., Mishra, S.P. and Sengupta, Rita (1989). Trainers Manual on Developing Entrepreneurial Motivation, NIESBUD, New Delhi
2. Betty, Gorddan B. (1979). Entrepreneurship, Playing to Win, Taraporewala, Mumbai
3. Entrepreneurship Development Institute in India (1987). Developing New Entrepreneurs, EDII, Ahmedabad, NISIET, Library : 338.93/EDI/87/25104.
4. Mancuso, Joseph (1974). The Entrepreneurs Handbook, Vol.I& II, Artech House Inc. USA.
5. Patel, V.G. (1987). Entrepreneurship Development in India and its relevant Developing Countries, Entrepreneurship Development Institute of India, Ahmedabad, NISIET, Library : 338.93 (540)/PAT/87/25103.
6. Singh, A.K., Lakhan Singh, R. and Roy Berman (2006). Dimensions of Agricultural Extension, Aman Publishing House, Meerut.
7. Mondal Sagar and G.L.Ray (2009). Text Book of Entrepreneurship and Rural Development. Kalyani Publishers, Ludhiana. ISBN 978-81-272-5599-2

**MRSPTU B.SC. (HONS.) AGRICULTURE SYLLABUS
2019 BATCH ONWARDS**

GEOINFORMATICS, NANO-TECHNOLOGY AND PRECISION FARMING

Subject Code: BAGRS1-557

L T P C

Duration: 15 (Hrs.)

1 0 0 1

Course Objectives:

1. To develop the ability of motivating the farmers to use original data from the field.
2. To familiarize students about the balanced and unbalanced amount of agricultural inputs.
3. To make them aware about sustainable crop production.

Course Outcomes:

1. Motivate the farmers to use original data from the field to analyse the spatial and temporal variability of the input factors.
2. Trying to educate farmers on the effects of using unbalanced amounts of agricultural inputs such irrigation, fertiliser, insecticides, and pesticides.
3. Effectively uses of inputs for sustainable crop production without harming environment.

Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1				2								
CO2						3						
CO3							3					

UNIT-I (3 Hours)

Precision agriculture: concepts and techniques; their issues and concerns for Indian agriculture; Geo-informatics- definition, concepts, tool and techniques; their use in Precision Agriculture.

UNIT-II (3 Hours)

Crop discrimination and Yield monitoring, soil mapping; fertilizer recommendation using geospatial technologies

UNIT-III (5 Hours)

Spatial data and their management in GIS; Remote sensing concepts and application in agriculture; Image processing and interpretation; Global positioning system (GPS), components and its functions; Introduction to crop Simulation Models and their uses for optimization of Agricultural Inputs; STCR approach for precision agriculture

UNIT-IV (4 Hours)

Nanotechnology, Definition, concepts and techniques, brief introduction about nanoscale effects, nano-particles, nano-pesticides, nano-fertilizers, nano-sensors, Use of nanotechnology in seed, water, fertilizer, plant protection for scaling-up farm productivity.

Recommended Text Books / Reference Books:

1. GIS : Fundamentals, Applications & Implementations – Dr. K Elangovan New India publishing Agency, New Delhi.
2. Remote sensing , GIS and wet land management - Er Tasneem Abbasi & Prof. S.A. Abbasi

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according to soil condition.

2. To comprehend the importance of plant nutrients, their mechanisms of transport to plants, and the factors that control their availability.
3. To be able about procedure of soil testing and establish soil testing laboratory to provide accurate knowledge to farmers.

Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												

PRACTICALS

1. Determination of organic carbon in soils
2. Determination of alkaline hydrolysable N in soils
3. Principle of colorimeter, its calibration, application and determination of available P in soils
4. Principle of flame photometer, its calibration, application and determination of available K in soils
5. Determination of exchangeable cations in soils
6. Determination of available S in soils
7. Principle of atomic absorption spectrophotometer, its calibration, application and determination of DTPA extractable Zn, Fe, Mn and Cu in soils
8. Digestion of plant samples for determination of nutrients
9. Determination of total N in plants
10. Determination of total P in plants
11. Determination of total K and S in plants
12. Determination of Zn, Fe, Mn and Cu in plants
13. Determination of total N in urea
14. Determination of water soluble P in SSP and DAP
15. Determination of total N and P in manure

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PESTS OF CROPS AND STORED GRAINS AND THEIR MANAGEMENT LAB

Subject Code: BAGRS1-561 **L T P C** **Duration: 30 (Hrs.)**

0 0 2 1

Course Objectives:

1. Acquainted with identifying several insect pests that affect stored grains, vegetables, and fields.
2. To determine the pest's type of damage and symptoms so that the appropriate pest management method can be used for effective control.
3. By using integrated pest management, crop pests can be managed without endangering the wellbeing of surrounding wildlife, plants, or the environment.

Course Outcomes:

1. Familiarized with identification of different insect pest of field, vegetables and stored grains at the field level.
2. To identify the type of damage and symptoms brought on by the pest so that the proper pest management strategy can be utilised for efficient control.
3. Integrated pest management can control crop pests without adversely affecting the health of plants, animals, or the environment.

Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												

PRACTICALS

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) Plantation, gardens, Narcotics, spices & condiments. Identification of insect pests and Mites associated with stored grain. Determination of insect infestation by different methods. Assessment of losses due to insects. Calculations on the doses of insecticides application technique. Fumigation of grain store / godown. Identification of rodents and rodent control operations in godowns. Identification of birds and bird control operations in godowns. Determination of moisture content of grain. Methods of grain sampling under storage condition. Visit to Indian Storage Management and Research Institute, Hapur and Quality Laboratory, Department of Food., Delhi. Visit to nearest FCI godowns.

DISEASES OF FIELD & HORTICULTURAL CROPS & THEIR MANAGEMENT-I LAB

Subject Code: BAGRS1-562 **L T P C** **Duration: 30 (Hrs.)**

0 0 2 1

Course Objectives:

1. The typical pathogens that cause diseases will be addressed to the students.
2. Appropriate management techniques can be used by understanding the various means of distribution.
3. It is possible to take actions that are both economical and environmentally friendly.

Course Outcomes:

1. Students will be familiar with the typical disease-causing microorganisms.
2. By knowing the different dissemination means suitable management practices can be applied.
3. Economical and eco-friendly measures can be used.

Mapping

**MRSPTU B.SC. (HONS.) AGRICULTURE SYLLABUS
2019 BATCH ONWARDS**

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.

LANDSCAPING

Subject Code: BAGRD1-571

L T P C

Duration: 30 (Hrs.)

2 0 0 2

Course Objectives:

1. Students will gain knowledge of gardening's significance, range, and various forms.
2. Choose a variety of trees, shrubs, and methods for their propagation.
3. The various establishment, care, and grass management strategies will be covered with the students.

Course Outcomes:

1. Students will learn about the importance, scope and different types of gardening.
2. Selection of different trees, shrubs and their propagation techniques.
3. Students will learn about the different principles of establishment, maintenance and lawn management practices.

Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												

UNIT-I (7 Hours)

Importance and scope of landscaping. Principles of landscaping, garden styles and types, terrace gardening, vertical gardening, garden components, adornments, lawn making, rockery, water garden, walk-paths, bridges, other constructed features etc. gardens for special purposes.

UNIT-II (7 Hours)

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

UNIT-III (6 Hours)

Other garden plants: palms, ferns, grasses and cacti succulents. Pot plants: selection, arrangement, management. Bio-aesthetic planning: definition, need, planning; landscaping of urban and rural areas

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2019 BATCH ONWARDS**

UNIT-IV (10 Hours)

Peri-urban landscaping, 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.

Recommended Text Books / Reference Books:

1. Complete Gardening in India – Gopalswamiengar
2. Complete Home Gardening – Dey, S.C.
3. Floriculture and Landscaping – Bose, T.K.
4. Floriculture and Landscaping – Deshraj
5. Floriculture in India – Randhawa and Mukhopadhyay
6. Introduction to Landscaping, Designing, Construction and Maintenance – Ronald J.Biondo and Charles B. Schroder
7. Landscape Gardening & Design with Plants – Supriya Kumar Bhattacharjee
8. Landscaping principles and practices – Jack E. Ingels

LANDSCAPING LAB

Subject Code: BAGRD1-575

L T P C

Duration: 30 (Hrs.)

0 0 2 1

Course Objectives

1. To aware students about various techniques of landscaping.
2. To familiarize them with methods used for propagation.
3. To teach them about designing of conservatory.

Course Outcomes:

1. To know about the different implements used in landscaping.
2. To know the different methods of propagation.
3. Students will learn about designing of conservatory and lathe house.

Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												

Practical

Identification of trees, shrubs, annuals, pot plants; Propagation of trees, shrubs and annuals, care and maintenance of plants, 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 lathe house. Use of computer software, visit to important gardens/ parks/ institutes.

**MRSPTU B.SC. (HONS.) AGRICULTURE SYLLABUS
2019 BATCH ONWARDS**

SYSTEM SIMULATION AND AGROADVISORY

Subject Code: BAGRD1-572	L T P C	Duration: 30 (Hrs.)
	2 0 0 2	

Course Objectives:

1. Students will study the many methods of weather forecasting.
2. Use of weather-based agro-advisory bulletins.
3. Students must be aware of the importance of forecasting in farming.

Course Outcomes :

1. Students will learn about the different techniques of weather forecasting.
2. Use of agro-advisory bulletin based on weather forecast.
3. To know the value of forecasting in agricultural farming.

Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												

UNIT-I (8 Hours)

System Approach for representing soil-plant-atmospheric continuum, system boundaries, Crop models, concepts & techniques, types of crop models, data requirements, relational diagrams

UNIT-II (8 Hours)

Weather forecasting, types, methods, tools & techniques, forecast verification; Value added weather forecast, ITK for weather forecast and its validity;

UNIT-III (7 Hours)

Other garden plants: palms, ferns, grasses and cacti succulents. Pot plants: selection, arrangement, management. Bio-aesthetic planning: definition, need, planning; landscaping of urban and rural areas

UNIT-IV (7 Hours)

Crop-Weather Calendars; Preparation of agro-advisory bulletin based on weather forecast. Use of crop simulation model for preparation of Agro-advisory and its effective dissemination.

SYSTEM SIMULATION AND AGROADVISORY LAB

Subject Code: BAGRD1-576	L T P C	Duration: 30 (Hrs.)
	0 0 2 1	

Course Objectives:

1. To aware them about preparation of charts based on weather forecasting.
2. To familiarize them about weather and crop management practices.
3. To teach them about use of statistical models in weather forecasting.

Course Outcomes:

1. To prepare different working charts based on weather forecast.
2. Analysis of varying weather and crop management practices.
3. Use of statistical accurate models in weather forecasting.

**MRSPTU B.SC. (HONS.) AGRICULTURE SYLLABUS
2019 BATCH ONWARDS**

Mapping												
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
UNIT-I (8 Hours)												
Introduction, History, Advantages and limitations; Types of cultures (seed, embryo, organ, callus, cell)												
UNIT-II (8 Hours)												
Stages of micro propagation, Axillary bud proliferation (Shoot tip and meristem culture, bud culture)												
UNIT-III (7 Hours)												
Organogenesis (callus and direct organ formation), Somatic embryogenesis, cell suspension cultures												
UNIT-IV (7 Hours)												
Production of secondary metabolites, Somaclonal variation, Cryopreservation												

MICRO PROPAGATION TECHNOLOGIES LAB												
Subject Code: BAGRD1-578				L T P C				Duration: 30 (Hrs.)				
				0 0 2 1								
Course Objectives:												
1. Providing information on the many tools used in laboratories to create culture medium.												
2. The various media preparation and sterilising processes will be covered with the students.												
3. The various stocks and working solutions produced in labs will be taught to students.												
Course Outcomes:												
1. Providing knowledge about different equipments used in laboratory to prepare culture media.												
2. Students will learn about the different methods of preparation and sterilization techniques of media.												
3. Students will learn the different stock and working solution prepared in labs.												
Mapping												
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
Practical												
Identification and use of equipments in tissue culture Laboratory, Nutrition media composition, sterilization techniques for media, containers and small instruments, sterilization techniques forexplants, Preparation of stocks and working solution, Preparation of working medium, Culturing of explants: Seeds, shoot tip and single node, Callus induction, Induction of somatic embryos regeneration of whole plants from different explants, Hardening procedures.												

SEMESTER

VI

**MRSPTU B.SC. (HONS.) AGRICULTURE SYLLABUS
2019 BATCH ONWARDS**

Recommended Text Books / Reference Books:

1. S.R.Reddy, 1999. Principles of Agronomy. Kalyani Publishers, New Delhi.
2. T.Yellamanda Reddy and G.H.Sankara Reddi, 2010. Principles of Agronomy. Kalyani Publishers, New Delhi.
3. Reddy, S. R. and Prabhakar Reddy, G. 2015. Dryland Agriculture. Kalyani Publishers.
4. Arnon,I. 1972. Crop Production in Dry Regions (Vol.I), Leonard Hill Pub. Co, London.
5. Dhruva Narayana, V.V., Sastry, G.S. and Patnaiak, V.S. 1999. Watershed Management in India. ICAR, New Delhi.
6. Jeevananda Reddy,S.2002. Dryland Agriculture in India: An agro-climatological and agro meteorological perspective. B S publications

Protected Cultivation and Secondary Agriculture

Subject Code: BAGRS1-652	L T P C	Duration: 15 (Hrs.)
	1 0 0 1	

Course Objectives: The specific objectives of this course are to:

1. Familiarize the students with the design of greenhouse, cost estimation and economic analysis.
2. Develop skill to erect protected structure equipped with irrigation, active and passive solar heating systems, drying.
3. Enable the students to know about important engineering properties and their application in post harvest technology equipments design and operation.

Course Outcomes: Students will be able to

- CO1. learn about greenhouse technology, types of green houses and construction of green houses.
 CO2. gain knowledge of greenhouse equipments, materials of construction for traditional and low cost green houses.
 CO3. learn about Irrigation systems used in greenhouses, shade net house in protected cultivation.
 CO4. grab the of knowledge of cleaning and grading moisture measurement.
 CO5. understand the material handling equipment, principle and working.

Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1									1			
CO2					1							
CO3		2										
CO4											2	
CO5							1					

UNIT-I (3 Hours)

Greenhouse technology: Introduction, Types of Greenhouses; Plant response to Greenhouse environment, Planning and design of greenhouses, Design criteria of green house for cooling and heating purposes.

UNIT-II (4 Hours)

Greenhouse equipment, materials of construction for traditional and low cost greenhouses. Irrigation systems used in greenhouses, typical applications, passive solar greenhouse, hot air greenhouse heating systems, greenhouse drying.

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2019 BATCH ONWARDS**

UNIT-III (4 Hours)

Important Engineering properties such as physical, thermal, aero & hydrodynamic properties of cereals, pulses and oilseed, their application in PHT equipment design and operation. Drying and dehydration.

UNIT-IV (4 Hours)

Moisture measurement, EMC, drying theory, various drying methods, commercial grain dryer (deep bed dryer, flat bed dryer, tray dryer, fluidized bed dryer, circulatory dryer and solar dryer), Material handling equipment; conveyer and elevators, their principle, working and selection.

Recommended Text Books / Reference Books:

1. Prasad Kumar. Green House Management for Horticulture Crops
2. Radha Manohar, K and Igathinathane. C. Greenhouse Technology and Management, 2nd Edition, BS Publications.
3. Tiwari, G.N. Greenhouse Technology for Controlled Environment. Narosa Publishing house Pvt.Ltd.
4. Singh Brahma and Balraj Singh., 2014. Advances in Protected Cultivation, New India Publishing Company.
5. Sahay, K.M. and Singh, K.K. 1994. Unit operations of Agricultural Processing. Vikas Publishing house Pvt. Ltd. New Delhi.
6. Chakraverty, A. Post Harvest Technology of cereals, pulses and oilseeds. Oxford & IBH publishing Co. Ltd., New Delhi.
7. Ojha, T.P and Michael, A.M. Principles of Agricultural Engineering, Vol. I, Jain Brothers, Karol Bag, New Delhi.

Diseases of Field and Horticultural Crops and their Management-II

Subject Code: BAGRS1-653

L T P C

Duration: 30 (Hrs.)

2 0 0 2

Course Objectives: The specific objectives of this course are to make the students to:

1. Know the symptoms, etiology, disease cycle and management of various field crops and horticultural crops.
2. Identify, diagnosis and treatment of selected horticulture and field crops.
3. Compare the means of dispersal of these diseases.

Course Outcomes: Students will be able to:

- CO1. know the common pathogens of different diseases.
 CO2. acquire the knowledge about etiology and symptoms of these diseases which helps in diagnosis of the diseases of field and horticultural crops.
 CO3. learn means of dispersal of these diseases suitable management methods can be applied.
 CO4. learn eco-friendly and economically suitable management practices may be adopted.
 CO5. understand different chemical control methods.

Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1				3								
CO2								1				
CO3		2										
CO4												1
CO5							3					

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2019 BATCH ONWARDS**

UNIT-I (9 Hours)

Economic importance, symptoms, causal organism, epidemiology, disease cycle and integrated management of diseases of wheat, barley, sugarcane, rapeseed & mustard, sesamum, sunflower, cotton, pulses.

UNIT-II (6 Hours)

Economic importance, symptoms, causal organism, epidemiology, disease cycle and integrated management of mentha, coriander, turmeric and berseem.

UNIT-III (9 Hours)

Economic importance, symptoms, causal organism, epidemiology, disease cycle and integrated management of diseases of citrus, mango, grapevine, sapota, ber, apple, pear, peach, plum, coconut, mulberry, chilli, potato, pea, onion, garlic cucurbits.

UNIT-IV (6 Hours)

Economic importance, symptoms, causal organism, epidemiology, disease cycle and integrated management of diseases of rose, chrysanthemum, gladiolus, marigold and jasmine.

Recommended Text Books / Reference Books:

1. Rangaswami, G & Mahadevan, K.2001. Diseases of crop plants in India, Prentice Hall of India Pvt.Ltd, New Delhi.
2. Singh, R.S.2005. Plant Diseases. Oxford & IBH Publications, New Delhi
3. Pathak, V.N.2001. Diseases of Fruit crops. Oxford & IBH Publications, New Delhi
4. Singh, R.S.1999. Diseases of Vegetable crops. Oxford & IBH Publications, New Delhi
5. Chaube, H.S and V.S. Pundhir, 2012. Crop Diseases & Their Management. PHI Pvt. Ltd, New Delhi

Post-harvest Management and Value Addition of Fruits and Vegetables

Subject Code: BAGRS1-654

L T P C

Duration: 15 (Hrs.)

1 0 0 1

Course Objective: The specific objectives of this course are to:

1. acquaint student the importance of post-harvest management and processing of fruits and vegetables.
2. impart knowledge about pre and postharvest factors affecting quality of horticultural produce
3. provide technical know-how on value addition of fruits/vegetables through different methods and to design storage structures for freshly harvested agricultural products in the field

Course Outcomes: Students will be able to:

- CO1. understand the post-harvest technology of horticultural crops.
 CO2. recognise the value addition of horticulture crops.
 CO3. handle the tool and equipment design for PHT (Post harvest technology) and value addition.
 CO4. study the various certification and accreditation i.e. FPO, ISO and other labelling.
 CO5. gain knowledge about the tomato processing, caning and drying of fruits and vegetables and various management technologies of food related to conventional and modern packaging methods

Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			1									

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2019 BATCH ONWARDS**

CO2					2							
CO3							2					
CO4					3							
CO5								1				

UNIT-I (4 Hours)

Importance of post-harvest processing of fruits and vegetables, extent and possible causes of post harvest losses; Pre-harvest factors affecting postharvest quality, maturity, ripening and changes occurring during ripening;

UNIT-II (3 Hours)

Respiration and factors affecting respiration rate; Harvesting and field handling; post harvest practices; Storage (ZECC, cold storage, CA, MA, and hypobaric)

UNIT-III (4 Hours)

Value addition concept; Principles and methods of preservation; Intermediate moisture food- Jam, jelly, marmalade, preserve, candy– Concepts and Standards; Fermented and non-fermented beverages.

UNIT-IV (4 Hours)

Tomato products- Concepts and Standards; Drying/ Dehydration of fruits and vegetables– Concept and methods, osmotic drying. Canning– Concepts and Standards, packaging of products.

Recommended Text Books / Reference Books:

1. P.H.Pandey. Principles & Practices of Post Harvest Technology
2. Amar Singh. Fruit Physiology and Production
3. Rathore, N.S., Mathur, G.K., Chasta, S.S. 2012. Post-harvest Management and Processing of Fruits and Vegetables. ICAR, New Delhi.
4. Srivastava, R.P. and Sanjeev Kumar. 2002. Fruit and Vegetable Preservation: Principles and Practices. International Book Distribution Company, Lucknow.
5. Giridharilal, G.S., Siddappa and Tondon, G.L. 2007. Preservation of Fruits and Vegetables. ICAR, New Delhi.
6. Mitra, S.K. 2005. Post Harvest Physiology and Storage of Tropical and Subtropical Fruits. CABI Publishers, Kolkatta.

Management of Beneficial Insects

Subject Code: BAGRS1-655

L T P C

Duration: 15 (Hrs.)

1 0 0 1

Course Objectives: The specific objectives of this course are to make the students able to:

1. know about importance of beneficial insects. Understand bee, silk and lac biology, morphology of host plants and their pest and diseases.
2. comprehend methods of rearing and management practices of bee keeping, mulberry and lac cultivation.
3. identify parasitoids and predators used in biological control of pests in bee, silk and lac cultivation and become familiarize with equipment's used in their production.

Course Outcomes: Students will be able to

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2019 BATCH ONWARDS**

- CO1. practice apiculture, sericulture and lac culture as an entrepreneur according to agro climatic zone.
CO2. understand commercial methods of rearing, equipment, seasonal management, insect pest and disease.
CO3. identify different bio control agents (Predator, Parasite and Parasitoids) and their use for sustainable pest management.
CO4. learn about mass multiplication technique of biological control agents and established a bio control lab in future as an entrepreneur.
CO5. know about important species for commercial use of honey bee, silkworm and lac insect.

Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			2									
CO2					1							
CO3						2						
CO4				3								
CO5									2			

UNIT-I (4 Hours)

Importance of beneficial Insects, Beekeeping and pollinators, bee biology, commercial methods of rearing, equipment used, seasonal management, bee enemies and disease. Bee pasturage, bee foraging and communication. Insect pests and diseases of honeybee. Role of pollinators in cross pollinated crops. Toxicity of insecticides

UNIT-II (4 Hours)

Types of silkworm and biology of silkworm. Mulberry cultivation, mulberry varieties and methods of harvesting and preservation of leaves. Rearing, mounting and harvesting of cocoons. Insect-pests and diseases of silkworm and their management. Rearing appliances of mulberry silkworm and methods of disinfection.

UNIT-III (3 Hours)

Lac insects: Species, morphology, biology, host plants. Lac production – seed lac, button lac, shellac, lac-products. Identification of major parasitoids and predators commonly being used in biological control.

UNIT-IV (4 Hours)

Insect orders bearing predators and parasitoids used in pest control and their mass multiplication techniques. Important species of pollinator, weed killers and scavengers with their importance. An introduction to economics and marketing of honey, silk and lac.

Recommended Text Books / Reference Books:

1. Aruga H. 1994. Principles of Sericulture. Oxford & IBH, New Delhi.
2. B.Vasanta Raj. Elements of Economic Entomology
3. Atwal AS. 2006. The World of the Honey Bee. Kalyani Publ., New Delhi.
4. Ganga G. 2003. Comprehensive Sericulture. Vol. II. Silkworm Rearing and Silk Reeling. Oxford & IBH, New Delhi.
5. Partiban S & David BV. 2007. Management of Household Pests and Public Health Pests. Namratha Publ., Chennai.
6. Singh S. 1975. Beekeeping in India. ICAR, New Delhi.

**MRSPTU B.SC. (HONS.) AGRICULTURE SYLLABUS
2019 BATCH ONWARDS**

Crop Improvement-II (Rabi crops)

Subject Code: BAGRS1-656

L T P C

Duration: 15 (Hrs.)

1 0 0 1

Course Objective: The specific objectives of this course will be to make the students to:

1. gain the knowledge on the centre of origin, distribution and wild relatives of various rabi crops
2. understand the genetics of qualitative and quantitative characters and plant genetic resources and their conservation process.
3. understand the major breeding objectives, procedures and innovative approaches for development of hybrids and varieties for different purposes.

Course Outcomes: Students will be able:

CO1. learn importance of wild relative to produce new varieties of Rabi crop.

CO2. learn Gene preservation method for further use to improve Rabi varieties.

CO3. apply breeding methods to improve Rabi crops.

CO4. identify resistance genes related to Rabi crop with high yield potential against Pest and pathogen and utilization genes.

CO5. learn new genetic approaches to achieve a definite ideotype of rabi crop.

Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1				3								
CO2								1				
CO3			1									
CO4	2											
CO5										2		

UNIT-I (3 Hours)

Centres of origin, distribution of species, wild relatives in different cereals, pulses, oilseeds, fodder crops and cash crops, Problems and present status of crop improvement in India with emphasis on the work done in Punjab. National and International centres of crop improvement

UNIT-II (3 Hours)

Plant genetic resources, its utilization and conservation; study of genetics of qualitative and quantitative characters. Conventional versus non-conventional methods for crop improvement.

UNIT-III (6 Hours)

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).

UNIT-IV (3 Hours)

Hybrid seed production technology of rabi crops. Ideotypes concept and climate resilient crop varieties for future.

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2019 BATCH ONWARDS**

Recommended Text Books / Reference Books:

1. Allard, R.W. 1960. Principles of Plant Breeding. John Wiley & Sons, New York.
2. Phundan Singh. 2006. Essential of Plant Breeding. Kalyani Publishers, Ludhiana. 54
3. Poehlman, J.M. and Borthakur, D. 1995. Breeding of Asian Field Crops. Oxford & IBH Publishing Co. Pvt. Ltd. New Delhi.
4. Sharma, J.R. 1994. Principles and Practice of Plant Breeding. Tata McGraw-Hill Publishing Co. Ltd., New Delhi.
5. Kallou, G.1994. Vegetable Breeding. Panima Educational Book Agency, New Delhi.
6. Kumar, N. 2006. Breeding of Horticultural Crops - Principles and Practices. New India Publishing Agency, New Delhi.
7. George Acquaaah..2012. Principles of Plant Genetics and Breeding. Blackwell Publishing Ltd., USA.

Principles of Organic Farming

Subject Code: BAGRS1-657	L T P C	Duration: 15 (Hrs.)
	1 0 0 1	

Course Objective: The specific objectives of this course will be to make the students to:

1. understand meaning, concepts and principles of organic farming and initiatives taken by government, NGOs and private sector for its promotion.
2. know about Organic ecosystem and Organic nutrient resources and its fortification.
3. comprehend choice of crops and varieties in organic farming and use of organic inputs for management of insect, pest, disease and weed.

Course Outcomes: Students will be able to:

- CO1. make proper use of initiatives taken by Government for organic produce.
 CO2. evaluate the role of NGOs in producing organic products.
 CO3. select the crops and varieties for organic produce.
 CO4. learn the process of certification of organic produce.
 CO5. analyse the steps in preparation and quality analysis of enrich compost, vermi compost and bio-fertilizers/bio-inoculants.

Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1								2				
CO2					1							
CO3		3										
CO4												1
CO5											2	

UNIT-I (4 Hours)

Principles and scope of organic farming in India; Initiatives taken by Government (central and state), NGOs and other organizations for promotion of organic agriculture. Organic farming - concept and definition, its relevance to India and global agriculture and future prospects. Organic production requirements. Biological intensive nutrient management. Recycling of organic residues. Soil improvement and amendments.

UNIT-II (5 Hours)

Organic ecosystem and their concepts; Organic nutrient resources and its fortification; Restrictions to nutrient use in organic farming; Choice of crops and varieties in organic farming. Soil fertility- nutrient

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2019 BATCH ONWARDS**

recycling, organic residues, organic manures, composting, soil biota and decomposition of organic residues, earthworms and vermi compost, green manures and bio fertilizers. Farming systems, crop rotations, intercropping in relation to maintenance of soil productivity.

UNIT-III (3 Hours)

Fundamentals of insect- pests, diseases and weed management under organic mode of production;
Operational structure of National Programme for Organic Production (NPOP);

UNIT-IV (3 Hours)

Certification process and standards of organic farming; Processing, labelling, economic considerations, viability, marketing and export potential of organic products.

Recommended Text Books / Reference Books:

1. Arun K. Sharma. 2002. A Hand book of organic farming. Agrobios, India. 627p.
2. Palaniappan, S.P and Annadurai, K.1999. Organic farming-Theory and Practice. Scientific publishers, Jodhpur,India. 257p.
3. Mukund Joshi and Prabhakarasetty, T.K. 2006. Sustainability through organic farming. Kalyani publishers, New Delhi. 349p.
4. Balasubramanian, R., Balakishnan, K and Siva Subramanian, K. 2013. Principles and practices of organic farming. Satish Serial Publishing House. 453p 39
5. Tarafdar, J.C., Tripathi, K.P and Mahesh Kumar, 2009. Organic agriculture. Scientific Publishers, India. 369p.
6. Tiwari, V.N., Gupta, D.K., Maloo, S.R and Somani, L.L. 2010. Natural, organic, biological, ecological and biodynamic farming. Agrotech Publishing Academy, Udaipur. 420p.
7. Dushyent Gehlot. 2005. Organic farming- standards, accreditation, certification and inspection. Agrobios, India. 357p

Farm Management, Production & Resource Economics

Subject Code: BAGRS1-658

L T P C

Duration: 15 (Hrs.)

1 0 0 1

Course Objective: The specific objectives of this course is to make the students able to:

1. know the concept of farms and principles of farm management, objectives, types and characteristics, various laws and relationship between different factors and products.
2. understand the cost concept, farm business, and technical and economic efficiency analysis of various enterprises, farm records, and linear programming.
3. comprehend the risk and uncertainty in agriculture, crop insurance, resource economics, externalities and management of common property resources.

Course Outcomes: Students will be able to:

- CO1. gain knowledge about comprehensive treatment of the traditional agricultural production economics topics
- CO2. focus on the neoclassical factor-product, factor-factor and product- product models
- CO3. understand limited resources available in the economy
- CO4. know about availability of rich natural endowments to achieve sustainable agricultural development
- CO5. gain knowledge of the causes of regional variations in productivity and production, social and economic inequality, size of land holdings and lack of quality inputs etc.

Mapping

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2019 BATCH ONWARDS**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1									2			
CO2							1					
CO3					3							
CO4			2									
CO5										1		

UNIT-I (4 Hours)

Agricultural Production Economics: definition, nature and scope. Laws of returns. Factor product relationship: determination of optimum input and output. Farm management: meaning, definition and importance.

UNIT-II (3 Hours)

Economic principles applied to the organizations of farm business. Types and systems of farming. Farm planning and budgeting. Risk and uncertainty. Agricultural finance: nature and scope, compounding and discounting.

UNIT-III (5 Hours)

Agricultural credit: meaning, definition, need and classification. Credit appraisal. History of financing agriculture in India. Agricultural Financial Institutions. Assessment of crop losses. Determination of compensation.

UNIT-IV (3 Hours)

Crop insurance. Agricultural Cooperation- philosophy and principles, History of Indian Cooperative Movement. Cooperative credit structure and reorganization of cooperative credit structure and single window system.

Recommended Text Books / Reference Books:

1. V.T. Raju, D.V.S Rao. Economics of Farm Production and Management
2. Bishop, C.E. and W. D. Tousaint. 1958. Introduction to Agricultural Economic Analysis. John Wiley and Sons, London.
3. Heady, Earl O. 1964. Economics of Agricultural Production and Resource Use. Prentice Hall of India, Private Limited, New Delhi
4. S.S. Johl, J.R. Kapur. 2006. Fundamentals of Farm Business Management.
5. Kahlon, A.S. and Karam Singh. 1965. Principles of Farm Business Management. Kalyani Publishers, New Delhi.
6. Raju, V.T. and D.V.S. Rao. 2006. Economics of Farm Production and Management. Oxford & IBH Publishing Co. Pvt. Limited, New Delhi

Principles of Food Science and Nutrition

Subject Code: BAGRS1-659

L T P C

Duration: 30 (Hrs.)

2 0 0 2

Course Objectives: The specific objectives of this course are to:

1. familiarize the students to basic concepts of food science, food composition and food chemistry
2. understand concepts of food microbiology and its use in production of fermented foods
3. develop insights in principles and methods of food processing and preservation.

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Course Outcomes:

- CO1. critically evaluates information on food science and nutrition issues appearing in the popular press.
CO2. discuss the important pathogen and spoilage microorganism in foods.
CO3. discuss basic principles and practices of cleaning and sanitation in food preparation operation.
CO4. identify and explain nutrients in foods and the specific functions in maintaining health.
CO5. impart knowledge about malnutrition, nutritional disorders; energy metabolism and balanced/modified diets

Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1						1						
CO2									2			
CO3			3									
CO4							2					
CO5	1											

UNIT-I (9 Hours)

Concepts of Food Science (definitions, measurements, density, phase change, pH, osmosis, surface tension, colloidal systems etc.); Food composition and chemistry (water, carbohydrates, proteins, fats, vitamins, minerals, flavours, colours, miscellaneous bio actives, important reactions). Food and its functions - energy giving, body building, protecting and regulating. Basic food groups.

UNIT-II (6 Hours)

Food microbiology (bacteria, yeast, moulds, spoilage of fresh & processed foods, Production of fermented foods); Principles and methods of food processing and preservation (use of heat, low temperature, chemicals, radiation, drying etc.);

UNIT-III (9 Hours)

Food and nutrition, Malnutrition (over and under nutrition), nutritional disorders. Nutrients, their functions, sources and deficiency diseases - proteins, carbohydrates, lipids, vitamins - fat soluble and water soluble, minerals. Concept of balanced diet. Recommended Dietary Allowances (RDA) for various age groups according to their physiological status for specific nutrients and energy.

UNIT-IV (6 Hours)

Energy metabolism (carbohydrates, fats, proteins); Balanced/modified diets, Menu planning, New trends in food science and nutrition. Water and electrolyte balance - functions and distribution in body. Basal metabolism - methods of measurement and factors affecting BMR.

Nutrition, infection and immunity. Nutritional status using dietary survey, anthropometry, clinical signs and biochemical methods. Nutrition education, nutrition policies and their implementation. Non-conventional foods and their use.

Recommended Text Books / Reference Books:

1. P.H.Pandey. Principles & Practices of Post Harvest Technology
2. D.V. Reedy. Applied Nutrition
3. Sumati R. Mudambi, Shalini M. Rao and M.V. Rajagopal. 2006. Food Science, 2nd Ed. New Age International (P) Limited, New Delhi.
4. Martin Eastwood. 2003. Principles of Human Nutrition. Blackwell Science Ltd., Oxford.
5. Norman N. Potter. 1998. Food Science, 5th Ed. Springer Science+ Business Media, New York.
6. Michael J. Pelczar Jr., E.C.S. Chan and Noel R. Krieg. 1998. Microbiology, 5th Ed. Tata McGraw-Hill Education, New Delhi.
7. William C. Frazier and & Dennis C. Westhoff. 1987. Food Microbiology, 4th Ed. Tata McGraw-Hill Education, New Delhi.
8. L.E. Casida Jr. 1968. Industrial Microbiology. New Age International Publishers, New Delhi.

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2019 BATCH ONWARDS**

9. P. Fellows. 2000. Food Processing Technology: Principles and Practice, 2nd Ed. CRC Press, Boca Raton, FL, USA.
10. Marcus Karel and Darvl B. Lund.2003. Physical Principles of Food Preservation, 2nd Ed. Marcel Dekker, Inc., NY, USA.
11. Gerald Wiseman. 2002. Nutrition and Health. Taylor & Francis, London.

Rainfed Agriculture & Watershed Management Lab

Subject Code: BAGRS1-660	L T P C	Duration: 30 (Hrs.)
	0 0 2 1	

Course Objectives: The specific objectives of this course are to make the students able to:

1. identify several plant diseases and pathogens.
2. identify of various pests' and pathogens' life cycles for the purpose of management measures.
3. develop various IPM techniques to control pests and diseases without contaminating the soil, water or environment.

Course Outcomes: Students will be able to:

- CO1. detect the different pathogens and diseases in plants.
CO2. identify life cycle of different pests and pathogens for control measures.
CO3. make different IPM strategies so that the pests and diseases can be controlled without soil, water and environment pollution.
CO4. make use of rainfall water for a larger area by suitable watershed management techniques.
CO5. conserve soil by adopting latest soil conservation techniques.

Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1						2						
CO2	3											
CO3									1			
CO4				1								
CO5					2							

PRACTICALS

Studies on climate classification, studies on rainfall pattern in rainfed areas of the country and pattern of onset and withdrawal of monsoons. Studies on cropping pattern of different rainfed areas in the country and demarcation of rainfed area on map of India. Interpretation of meteorological data and scheduling of supplemental irrigation on the basis of evapo-transpiration demand of crops. Critical analysis of rainfall and possible drought period in the country, effective rainfall and its calculation. Studies on cultural practices for mitigating moisture stress. Characterization and delineation of model watershed. Field demonstration on soil & moisture conservation measures.

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CO2	2											
CO3								1				
CO4	2											
CO5				1								

Practical

Preparation of farm layout. Determination of cost of fencing of a farm. Computation of depreciation cost of farm assets. Determination of most profitable level of inputs use in a farm production process. Determination of least cost combination of inputs. Selection of most profitable enterprise combination. Application of cost principles including CACP concepts in the estimation of cost of crop and livestock enterprises. Preparation of farm plan and budget, farm records and accounts and profit & loss accounts. Collection and analysis of data on various resources in India.

Hi-tech Horticulture

Subject Code: BAGRD1-671

L T P C

Duration: 30 (Hrs.)

2 0 0 2

Course Objectives: The specific objectives of this course are to:

- 1 impart knowledge of mechanization, micro propagation and protected cultivation of horticultural crops
- 2 develop understanding of application of precision farming in horticultural crop
- 3 analyse the greenhouses based on shape, utility, construction, covering materials and cost.

Course Outcomes: Students will be able to:

- CO1. deal with seed production technology of horticultural crops.
- CO2. study Plant Propagation and Nursery Management.
- CO3. learn importance & scope of hi-tech horticulture in India.
- CO4. manage Hi-tech nursery & mechanization of horticultural crops.
- CO5. learn Protected cultivation: advantages & constraints.

Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1									1			
CO2					2							
CO3		2										
CO4										2		
CO5						1						

UNIT-I (7 Hours)

Introduction & importance; Nursery management and mechanization; micro propagation of horticultural crops.

UNIT-II (7 Hours)

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2019 BATCH ONWARDS**

UNIT-III (7 Hours)

The agricultural story: Types of agricultural stories, subject matter of the agricultural story, structure of the agricultural story. Gathering agricultural information: Sources of agricultural information, interviews, coverage of events, abstracting from research and scientific materials, wire services, other agricultural news sources.

UNIT-IV (7 Hours)

Writing the story: Organizing the material, treatment of the story, writing the news lead and the body, readability measures. Illustrating agricultural stories: Use of photographs, use of artwork (graphs, charts, maps, etc.), writing the captions. Editorial mechanics: Copy reading, headline and title writing, proofreading, lay outing.

Recommended Text Books/ Reference Books:

1. Arvind Kumar (1999). The Electronic Media. Anmol Publications, New Delhi.
2. Bhatt, S.C. (1993) Broadcast Journalism. Basic Principles Har Anand Publications, Delhi.
3. Bhatnagar, R. (2001). Print Media and Broadcast Journalism. Indian Publisher Distributors, Delhi
4. Katyal, V.P (2007). Fundamentals of Media Ethics. Cyber Tech Publishers, New Delhi.
5. Yadava, J.S and Mathur, P. (1998). Issues in Mass Communication: the basic concepts. Volumes 1 and 2. Indian Institute of Mass Communication, New Delhi.

Agricultural Journalism Lab

Subject Code: BAGRD1-676	L	T	P	C	Duration: 30 (Hrs.)
	0	0	2	1	

Course Objectives: The specific objectives of this course are to:

1. teach students about many forms of communication
2. learn how to write facts and get knowledge about agriculture
3. spread information about journalism and mass communication throughout several fields of study.

Course Outcomes: Students will be able to:

- CO1. learn about journalism and mass communication in a variety of fields of study.
- CO2. comprehend the ideas behind communication, as well as its significance in society.
- CO3. study ICT-related skills.
- CO4. communicate with the public effectively through a number of media by being objective and critical-thinking.
- CO5. become a dynamic professional with a commitment to carrying out one's duties while adhering to the highest standards of integrity and competence.

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2019 BATCH ONWARDS**

Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1									2			
CO2						2						
CO3					3							
CO4			1									
CO5							2					

Practical

Practice in interviewing. Covering agricultural events. Abstracting stories from research and scientific materials and from wire services. Writing different types of agricultural stories. Selecting pictures and artwork for the agricultural story. Practice in editing, copy reading, headline and title writing, proof-reading, layouting. Testing copy with a readability formula. Visit to a publishing office.

Food Safety And Standards

Subject Code: BAGRD1-673

L T P C

Duration: 30 (Hrs.)

2 0 0 2

Course Objectives: The specific objectives of this course are to:

1. know about the food safety and its various standards.
2. ensure that food is safe and is handled safely, as well as to ensure the health-related quality of food and that its quality in other respects accords with the food regulations
3. protect the consumer from health hazards and financial losses caused by foods that violates the food regulations

Course Outcomes: Students will be able to:

- CO1. understand the food safety, hazards and risks, types of hazards - biological, chemical, physical hazards.
- CO2. gain knowledge about food storage, hygiene and sanitation.
- CO3. understand food laws and standards Indian food regulatory regimes.
- CO4. explain importance of nutrients in food and the specific functions in maintaining health.
- CO5. discuss the important pathogen and spoilage microorganism in foods.

Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												1
CO2									1			
CO3							2					
CO4				1								
CO5												2

**MRSPTU B.SC. (HONS.) AGRICULTURE SYLLABUS
2019 BATCH ONWARDS**

UNIT-I (8 Hours)

Food Safety – Definition, Importance, Scope and Factors affecting Food Safety. Hazards and Risks, Types of hazards - Biological, Chemical, Physical hazards. Management of hazards - Need. Control of parameters. Temperature control. Food storage. Product design.

UNIT-II (8 Hours)

Hygiene and Sanitation in Food Service Establishments- Introduction. Sources of contamination and their control. Waste Disposal. Pest and Rodent Control. Personnel Hygiene. Food Safety Measures. Food Safety Management Tools- Basic concepts. PRPs, GHPs, GMPs, SSOPs etc. HACCP. ISO series.

UNIT-III (7 Hours)

TQM- concept and need for quality, components of TQM, Kaizen. Risk Analysis. Accreditation and Auditing, Water Analysis, Surface Sanitation and Personal Hygiene. Food laws and Standards- Indian Food Regulatory Regime, FSSAI. Global Scenario CAC. Other laws and standards related to food. Recent concerns- New and Emerging Pathogens.

UNIT-IV (7 Hours)

Packaging, Product labelling and Nutritional labelling. Genetically modified foods, transgenic. Organic foods. Newer approaches to food safety. Recent Outbreaks. Indian and International Standards for food products.

Recommended Text Books/ Reference Books:

- 1) Food Microbiology. W.C. Frazier and D.C. Westhoff, 4th Edn. Tata McGraw-Hill Publishing Company Limited, New Delhi.
- 2) Food Safety Handbook. Ronald H. Schmidt and Gary E. Rodrick. 2003. John Wiley & Sons, Inc., Hoboken. New Jersey, USA.
- 3) Food Safety and Food Quality. R.E. Hester and R.M. Harrison. 2001. Royal Society of Chemistry, Cambridge, UK.
- 4) The Safety of Foods (Sicherheit von Lebensmitteln). Graham Graham, H. D. (Edit.) 2. Auflage. AVI Publishing Co., Inc., Westport, Connecticut (USA)
- 6) Food Chemistry (New Edition).Owin R. Fenema
- 7) Handbook of Food Toxicology. S.S. Deshpande, CRC Press. 2002.
- 8) Food Hygiene and Sanitation. S. Roday, Tata McGraw-Hill Education
- 9) Food Microbiology. M.R. Adams and M.O. Moss
- 10) Food Quality Assurance: Principles and Practices. Inteaz Alli. 2004. CRC Press, Boca Raton, FL, USA.
- 11) Food Plant Sanitation: Design, Maintenance, and Good Manufacturing Practices. Michael M. Cramer. 2013. CRC Press, Boca Raton, FL, USA.
- 12) Regulatory status of Direct Food Additives. Furia TE. 1980. CRC Press.
- 16) Sensory Evaluation of Food - Theory and Practice. Jellinek G. 1985. Ellis Horwood.
- 18) Quality Control in Food Industry. Krammer A & Twigg BA. 1973. Vol.I, II. AVI Publ.

Food Safety And Standards Lab

Subject Code: BAGRD1-677

L T P C

Duration: 30 (Hrs.)

0 0 2 1

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Course Objectives: The specific objectives of this course are to:

1. know about food safety and its varied standards.
2. Ensure the health-related quality of food, that it is handled properly, and that its quality in all other regards complies with food rules.
3. safeguard consumers from health risks and financial losses brought on by eating food that doesn't comply with food regulations

Course Outcomes: Students will be able to:

CO1. analyse the different physio-chemical properties of water.

CO2. learn about cleanliness, hygiene, and food storage.

CO3. knowledge of food laws and regulations Indian laws governing food.

CO4. emphasise the significance of nutrients in food and their specialised roles in supporting health.

CO5. learn about the pathogens and bacteria that cause food to deteriorate.

Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1						3						
CO2	1											
CO3									1			
CO4				3								
CO5					2							

Practical

Water quality analysis physio-chemical and microbiological. Preparation of different types of media. Microbiological Examination of different food samples. Assessment of surface sanitation by swab/rinse method. Assessment of personal hygiene. Biochemical tests for identification of bacteria. Scheme for the detection of food borne pathogens. Preparation of plans for Implementation of FSMS - HACCP, ISO: 22000.

Agri-business Management

Subject Code: BAGRD1-674

L T P C

Duration: 30 (Hrs.)

2 0 0 2

Course Objectives: The specific objectives of this course are to:

1. know about the concepts of agribusiness and agro-based industries.
2. understand primary and supportive activities and different management functions.
3. comprehend financial statements and marketing Management.

Course Outcomes: Students will be able to

CO1. know the concept of agribusiness and agro-based industries.

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CO2. understand primary and supportive activities and different management functions.
CO3. analyse Financial statements and Marketing Management.
CO4. evaluate Product Life Cycle (PLC) and project cycle.
CO5. analyse Product Life Cycle (PLC) and project cycle.

Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2											
CO2		1										
CO3				3								
CO4			2									
CO5						1						

UNIT-I (8 Hours)

Nature and scope of agribusiness. Evolution and changing dimensions of agribusiness in India with special reference to Punjab. Characteristics of production, consumption and marketing of agricultural surplus. Processing of agricultural output.

UNIT-II (8 Hours)

Entrepreneurship in agribusiness. Types and patterns of organization in agribusiness. Principles of management and application in agribusiness enterprises. Locational factors and various other problems faced by agro industrial and other enterprises related with agribusiness. Business environment: PEST & SWOT analysis. Management functions: Roles & activities, Organization culture.

UNIT-III (7 Hours)

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.

UNIT-IV (7 Hours)

Marketing Management: Segmentation, targeting & positioning. Marketing mix and marketing strategies. Consumer behaviour analysis, Product Life Cycle (PLC). Sales & Distribution Management. Pricing policy, various pricing methods. Project Management; project cycle, identification, formulation, appraisal, implementation, monitoring and evaluation. Project Appraisal and evaluation techniques.

Recommended Text Books/ Reference Books:

- 1) Agribusiness Management by Dr. Shivaji Nagpure & Dr. R.G. Deshmukh, M/s. AGROMET Publishers, Nagpur.
- 2) Indian Agriculture & Agri-Business Management by Dr. Smita Diwase, M/s. Scientific Publishers, Jodhpur, Rajasthan.
- 3) Agricultural Finance & Management by S. Subha Reddy, & P. Raghu Ram, M/s. Oxford IBH Publishing Co. Pvt. Ltd., New Delhi.
- 4) Agri Business Management by Dr. J.S. Amarnath & Dr. A.P.V. Samvel, M/s. Satish Serial Publishing House, Delhi-110033.

