

B.Sc. Agriculture (Honors) Syllabus (6th Semester) for 2018-19 & 2019 - 20

**Mata Gujri College
Sri Fatehgarh Sahib
(AN AUTONOMOUS COLLEGE)**

RE-ACCREDITED BY NAAC WITH “A” GRADE

“COLLEGE WITH POTENTIAL FOR EXCELLENCE” STATUS BY UGC

**Syllabus
For
B. Sc. Agriculture (Honours) Third Year
(6th Semester)**



Academic Session 2018-19 & 2019-20

B.Sc. Agriculture (Honors) Syllabus (6th Semester) for 2018-19 & 2019 - 20

Outline of the Syllabus for Semester-VI
B.Sc. Agriculture (Hons.) Course (Semester System)
Semester-VI

Paper code	Subject	Periods per week		Marks		Internal assessment		Total marks		Grand Total
		Theory	Practical	Theory	Practical	Theory	Practical	Theory	Practical	
Hort-601	Spices and plantation crops	3	1	30	25	25	0	50	25	75
Hort -602	Post Harvest Technology of Horticultural Crops	3	1	30	25	25	0	50	25	75
Path -603	Disease of fruit and vegetable crops	3	1	30	25	25	0	50	25	75
Hort-604	Protected cultivation of Horticultural crops	3	1	30	25	25	0	50	25	75
Hort -605	Landscaping and ornamental horticulture	3	1	30	25	25	0	50	25	75
Econ-606	Agricultural Pest Management	3	1	30	25	25	0	50	25	75
Agron-607	Farming Systems and Sustainable Agriculture	2	1	30	25	25	0	50	25	75
Agron-608	Silviculture and Agroforestry	3	1	30	25	25	0	50	25	75
BAG 604	Agricultural Marketing	3	1	30	25	25	0	50	25	75
Total		26	9	270	225	225	0	450	225	675

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B.Sc. AGRICULTURE (HONS.) VI SEMESTER

Hort- 601 Spices and plantation crops

**Max. Marks
(Theory + Practical): 75
Total marks Theory: 50
External theory marks: 30
Internal assessment: 20
Periods per week (Theory): 3**

Instructions for the Paper Setter

The question paper will consist of three sections A, B and C. Section A will have four questions from unit 1 of the syllabus and section B will have four questions from unit 2 of the syllabus carrying 6 marks each. Students will have to attempt two questions from each section. Section C will consist of 12 short answer type questions which will cover the entire syllabus uniformly and will carry half marks for each question. All questions of section C are compulsory.

Theory

UNIT I

Definition, classification, scope and importance in India. Origin, distribution, area, production, botany, varieties, climate, soil, propagation, nursery management, site selection, layout, planting, crop management including manuring, irrigation, shade regulation.

UNIT II

Harvesting, yield of the following crops: pepper, cardamom, ginger, turmeric, cinnamon, nutmeg, clove, vanilla and all spice. List of seed and herbal spices and minor essential oil yielding plants. Package and practices of plantation crops coconut, cashewnut, arecanut, betelvine, cashewnut, tea, cocoa, coffee and oil palm.

Practical

Hort- 601 Spices and plantation crops

**Total marks: 25
Period per week: 1**

1. Morphology and floral biology of pepper, cardamom, ginger, turmeric and plantation crops.
2. Nursery techniques, planting in main field of pepper, cardamom, ginger, turmeric and plantation crops.
3. Intercultivation and harvesting of pepper, cardamom, ginger, turmeric and plantation crops
4. Botanical description and identification of plantation crops.
5. Propagation methods in spices and plantation Crops.

Suggested readings:

1. Chadha KL and Rethiam P.1994. *Advances in Horticulture* (Volume 9), plantation and Spice Crops (Part 1 and 2), New Delhi: Malhotra Publishing House
2. Kumar N, JBM Md. Abdul khander, Rangaswami P and Irulappan I.2001. *Introduction of spices, Plantation Crops, Medicinal and Aromatic plants*, New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd.

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Hort- 602 Post Harvest Technology of Horticultural Crops

Max. Marks
(Theory + Practical): 75
Total marks Theory: 50
External theory marks: 30
Internal assessment: 20
Periods per week (Theory): 3

Instructions for the Paper Setter

The question paper will consist of three sections A, B and C. Section A will have four questions from unit 1 of the syllabus and section B will have four questions from unit 2 of the syllabus carrying 6 marks each. Students will have to attempt two questions from each section. Section C will consist of 12 short answer type questions which will cover the entire syllabus uniformly and will carry half marks for each question. All questions of section C are compulsory.

Theory

UNIT I

Importance 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; Respiration and factors affecting respiration rate; Role of ethylene; Post harvest disease and disorders; Harvesting and field handling; Storage (ZECC, cold storage, CA, MA, and hypobaric).

UNIT II

Value addition concept; Principles and methods of preservation; Intermediate moisture food- Jam, jelly, marmalade, preserve, candy - Concepts and Standards; Fermented and non-fermented beverages. Tomato products- Concepts and Standards; Drying/ Dehydration of fruits and vegetables - Concept and methods, osmotic drying. Canning — Concepts and Standards, packaging of products.

Practical

Hort 602: Post Harvest Technology of Horticultural Crops

Total marks: 25
Period per week: 1

1. Applications of different types of packaging containers for shelf life extension.
2. Effect of temperature on shelf life and quality of produce.
3. Extraction and preservation of pulps and juices.
4. Preparation of jam, jelly, RTS, nectar, squash
5. Fruit bar and candy and tomato products, canned products.

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6. Quality evaluation of products — physico-chemical and sensory.
7. Visit to processing unit/ industry

Suggested readings:

1. Verma L.R. and Joshi V.K. 2009. *Post harvest technology of Fruits and Vegetables*, Indus Publishing Company.
2. Pandey P.H. 2007. *Principles and practices of Post Harvest Technology*, Kalyani Publishers.
3. Hule A. 1971. *Biochemistry of Fruits and their Products* Vol. 2. Academic Press, London.

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B.Sc. AGRICULTURE (HONS.) VI SEMESTER

Path 603: Diseases of fruit and vegetables crops

Max. Marks
(Theory + Practical): 75
Total marks Theory: 50
External theory marks: 40
Internal assessment: 10
Periods per week (Theory): 3

Instructions for the Paper Setter

The question paper will consist of three sections A, B and C. Section A will have four questions from unit 1 of the syllabus and section B will have four questions from unit 2 of the syllabus carrying 6 marks each. Students will have to attempt two questions from each section. Section C will consist of 12 short answer type questions which will cover the entire syllabus uniformly and will carry half marks for each question. All questions of section C are compulsory.

Theory

UNIT I

Concept of diseases. Losses caused by diseases. Economic Importance, symptoms, cause, disease cycle and management of diseases of: citrus (Canker), mango (Mango malformation, Black tip and Powdery mildew), banana (Panama wilt and Black Sigatoka leaf spot), grapevine (Downy mildew and Anthracnose), pomegranate (Bacterial leaf spot), guava (Anthracnose), apple (Apple scab and Bitter rot),

UNIT II

Brinjal (Little leaf of brinjal and Phomopsis blight), bhendi (BYVMV and root knot), potato (Late and Early blight), cauliflower (Bacterial soft rot), cucumber (Powdery and Downy mildew), tomato (early blight and leaf curl), french bean (angular leaf spot), onion (purple blotch), rose (Black leaf spot and Powdery mildew), chrysanthemum (Leaf spot) and gladiolus (Fusarium and Botrytis).

Practical

Path 603: Diseases of fruit crops and vegetables

Total marks: 25
Period per week: 1

1. Study of characteristics of various genera of fungi, bacteria, nematodes and phanerogamic parasites.
2. Familiarization with symptoms caused by different pathogens.
3. Diagnosis and microscopic study of diseased plant specimens.
4. To work out doses preparation and application of fungicidal materials.

Suggested readings:

1. George Agrios. 2004. *Plant Pathology* (5th Edition), Academic Press. Elsevier.
2. R.S. Singh. 1990. *Plant diseases*. Oxford and IBH Publishing.
3. R.S. Singh. 1990. *Introduction to Principles of Plant Pathology*, (Fourth Edition), Oxford and IBH Publishing

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B.Sc. AGRICULTURE (HONS.) VI SEMESTER

Hort -605 Landscaping and ornamental horticulture

Total marks

Theory: 50

External theory marks: 30

Internal assessment: 20

Periods per week (Theory): 3

Instructions for the Paper Setter

The question paper will consist of three sections A, B and C. Section A will have four questions from unit 1 of the syllabus and section B will have four questions from unit 2 of the syllabus carrying 6 marks each. Students will have to attempt two questions from each section. Section C will consist of 12 short answer type questions which will cover the entire syllabus uniformly and will carry half marks for each question. All questions of section C are compulsory.

Theory

UNIT I

Introduction to landscaping and gardening - components of landscapes and gardens description and functional uses. Landscape designs, types of gardens, English, Mughal, Japanese, Persian, Spanish, Italian, Vanams, Buddha garden; Styles of garden, formal, informal and free style gardens. Urban landscaping, Landscaping for specific situations, institutions, industries, residents, hospitals, roadsides, traffic islands, damsites, IT parks, corporates. Garden plant components, arboretum, shrubbery, fernery, palmatum, arches and pergolas.

UNIT II

Edges and hedges, climbers and creepers, cacti and succulents, herbs, annuals, flower borders and beds, ground covers, carpet beds, bamboo groves; Production technology for selected ornamental plants. Lawns, Establishment, management and maintenance, special types of gardens, vertical garden, roof garden, bog garden, sunken garden, rock garden, clock garden, colour wheels, temple garden, sacred groves. Bio-aesthetic planning, eco-tourism, theme parks, indoor gardening.

Practical

Hort 605 Landscaping and ornamental horticulture

Total marks: 25

Period per week :1

1. Selection of ornamental plants.
2. Practices in preparing designs for home gardens, industrial gardens, institutional gardens, corporates, avenue planting.
3. Practices in planning and planting of special types of gardens.
4. Lawn making, Planting herbaceous and shrubbery borders
5. Project preparation on landscaping for different situations
6. Visit to parks and botanical gardens,
7. Case study on commercial landscape gardens.
8. Visit to gardens, commercial farms and markets.

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Suggested readings:

1. Randhawa GS and Mukho Padyay A . 2000. *Floriculture in India*, Kalyani Publishers.
2. Prasad, Singh and Kumar. 2012. *Commercial Floriculture* (2nd Edn), Kalyani Publishers.

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B.Sc. AGRICULTURE (HONS.) VI SEMESTER

Ento-606 Agricultural Pest Management

Max. Marks
(Theory + Practical): 75
Total marks Theory: 50
Theory: 30
Internal assessment: 20
Periods per week (Theory): 3

Instructions for the Paper Setter

The question paper will consist of three sections A, B and C. Section A will have four questions from unit 1 of the syllabus and section B will have four questions from unit 2 of the syllabus carrying 6 marks each. Students will have to attempt two questions from each section. Section C will consist of 12 short answer type questions which will cover the entire syllabus uniformly and will carry half marks for each question. All questions of section C are compulsory.

Theory

UNIT I

Systematic position, identification, distribution, host range, bionomics and seasonal abundance, nature and extent of damage and management of insect pest of various crops. Horticultural crops: mango, banana, papaya, citrus, apple, tomato, brinjal, okra and all gourds.

UNIT II

Systematic position, identification, distribution, host range, bionomics and seasonal abundance, nature and extent of damage and management of insect pest of various crops- field crops: rice, wheat, sugarcane, cotton, maize groundnut and mustard. Storage pest: insects, mites and rodents associated with stored grain including agricultural products.

Practical

Ento-606 Agriculture Pest and their Management

Total marks: 25
Period per week: 1

1. Collection and identification of important pest and their natural enemies.
2. Detection and estimation and losses in different crops.
3. Study of life cycle of important insect pest.
4. Field visits and prepared report.

Suggested reading:

1. Mathur Y. K and Upadhyay K. D. 2012. *A textbook of Entomology*. Aman Publishing House, Meerut.
2. Atwal A.S. and Dhaliwal G.S. 2012. *Agricultural Pests of South Asia and their management*, Kalyani Publishers.

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B.Sc. AGRICULTURE (HONS.) VI SEMESTER

Agron -607 Farming Systems and Sustainable Agriculture

**Max. Marks
(Theory + Practical): 75
Total marks Theory: 50
Theory assessment: 30
Internal assessment: 20
Periods per week (Theory): 3**

Instructions for the Paper Setter

The question paper will consist of three sections A, B and C. Section A will have four questions from unit 1 of the syllabus and section B will have four questions from unit 2 of the syllabus carrying 6 marks each. Students will have to attempt two questions from each section. Section C will consist of 12 short answer type questions which will cover the entire syllabus uniformly and will carry half marks for each question. All questions of section C are compulsory.

Theory

UNIT I

Farming system: definition, principles advantages and components. Factors affecting farming system. Farming system model for rainfed and irrigated situations. Crop diversification- definition, scope and advantages.

UNIT II

Sustainable agriculture: Introduction, definition, goal and current concepts, factors affecting ecological balance and ameliorative measures; Land degradation and conservators of natural resources, LEIA & HEIA; Irrigation problems, waste lands and their development. Organic farming: definition, principles and component.

Practical

Agron -607 Farming Systems and Sustainable Agriculture

**Total marks Practical: 25
Period per week: 1**

1. Preparation of cropping scheme for irrigated situations.
2. Preparation of cropping scheme for dry land situations.
3. Study of existing farming systems in nearby villages.
4. Preparation of integrated farming system model for wetlands.
5. Preparation of integrated farming system model for drylands.
6. Preparation of enriched Farm Yard Manure.
7. Preparation of Vermicompost; Visit to urban waste recycling unit.
8. Study of profitable utilization of agricultural wastes.
9. Visit to poultry and dairy units to study resource allocation, utilization and economics.
10. Visit to an organic farm to study various components and utilization.

Suggested readings:

1. Panda. S.C. 2014. *Cropping and Farming System*. Agrobios.
2. Reddy, S.R. 2012. *Principles of Crop Production*. Kalyani Publishers.
3. Reddy T.Y, Reddy and G.H. 2013. *Principles of Agronomy*. Kalyani Publishers.

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B.Sc. AGRICULTURE (HONS.) VI SEMESTER

Agron -608 Silviculture and Agroforestry

**Max. Marks
(Theory + Practical): 75
Total marks Theory: 50
Theory: 30
Internal assessment: 20
Periods per week (Theory): 3**

Instructions for the Paper Setter

The question paper will consist of three sections A, B and C. Section A will have four questions from unit 1 of the syllabus and section B will have four questions from unit 2 of the syllabus carrying 6 marks each. Students will have to attempt two questions from each section. Section C will consist of 12 short answer type questions which will cover the entire syllabus uniformly and will carry half marks for each question. All questions of section C are compulsory.

Theory

UNIT I

Silviculture: Definition and scope of silviculture, Forestry, its scope and classification. Role of forests - geographic, productive and bioaesthetical. Elementary idea of forest types. Regeneration of forests. Agroforestry. Definition, concept and need of agro forestry and Social forestry. Classification of agro forestry and Social forestry systems.

UNIT II

Prominent agro forestry and Social forestry systems prevailing in Punjab. Limitations of agro forestry and social forestry, choice of tree species for agro forestry and Social forestry for fuel, fodder and timber requirement. Shelter belt and wind breaks trees. Cultivation of teak, sal, eucalyptus and poplar trees.

Practical

Agron -608 Silviculture and Agroforestry

**Total marks: 25
Period per week: 1**

1. Afforestation.
2. Techniques for problematic sites viz. ravines, saline-alkali soils.
3. Waterlogged areas, arid areas, hilly areas; roadside and canal bank plantation.
4. Nursery techniques - Numerical problems.
5. Raising of nursery and planting of seedlings in the field.
6. Numerical problems on planting and cost of earthwork estimation.
7. Identification of forest tree species.

Suggested readings:

1. Chundawat B. S. and Gautam S. K. 2015. *Text Book of Agroforestry*, Oxford and IBH Pvt. Ltd.
2. Nair P.K.R. 2011. *An Introduction to Agroforestry*, Kluwer Academic Publishers.
- 3.

B.Sc. AGRICULTURE (HONS.) VII SEMESTER

HORT. 604 PROTECTED CULTIVATION OF HORTICULTURAL CROPS

Time: 3 Hours

Max. Marks: 75

Periods per Week 2+1

Theory: 50

External Assessment: 40

Internal Assessment: 10

Practical: 25

Instructions for the Paper Setters

1. Question paper should be set strictly according to the syllabus.
2. The language of questions should be straight & simple.
3. Not more than one question should be based on one topic.
4. The question paper should cover the whole syllabus and questions should be evenly distributed.
5. Eight questions should be set, out of which the candidates can attempt any five.

Theory

Unit I

Greenhouse – World scenario, Indian situation: present and future. Different agro climatic zones in India. Basics of greenhouse design, different types of structures – glasshouse, shade net, poly tunnels - Design and development of low cost greenhouse structures. Interaction of light, temperature, humidity and CO₂ on crop regulation, Greenhouse heating, cooling, ventilation and shading. Types of ventilation- Forced cooling techniques - Glazing materials.

Unit II

Micro irrigation and Fertigation. General POP commercially cultivated Fruits— strawberry, papaya, vegetables- Capsicum, Tomato, Seedless Cucumber, Broccoli, Flowers- Rose, Gerbera, Carnation, Gladiolus.

Practicals:

1. Designs of greenhouse, low cost poly tunnels, nethouse.
2. Regulation of light, temperature, humidity in greenhouses.
3. Media.
4. Greenhouse cooling systems.
5. Ventilation systems.

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6. Fertigation systems.
7. Project preparation for greenhouses.
8. Visit to greenhouses.

Suggested Readings:

1. Aldrich RA & Bartok JW. 1994. *Green House Engineering*. NRAES,
2. Riley, Robb Hall, Cornell University, Ithaca, New York.
3. Bhattacharjee BS. 1959. *Rose Growing in Tropics*. Thackarspink & Co.
4. Laurie A, Kiplingr DD & Nelson KS. 1968. *Commercial Flower Forcing*. McGraw Hill.
5. Mears DR, Kim MK & Roberts WJ. 1971. Structural Analysis at an Experimental Cable-supported Air Inflated Green Houses. Trans.ASAE.
6. Pant V Nelson. 1991. *Green House Operation and Management*. Bali Publ.
7. Pradeepkumar T, Suma B, Jyothibhaskar & Satheesan KN. 2007. *Management of Horticultural Crops*. Parts I, II. New India Publ. Agency.