

B. Sc. Agriculture (Honors) Syllabus (4th Semester) for 2018-19 & 2019-20

Mata Gujri College

Sri Fatehgarh Sahib

(An Autonomous College)

Affiliated to Punjabi University Patiala

Syllabus

For

B. Sc. Agriculture (Honors) Second Year

(4th Semester)



Academic Session 2018-2019 & 2019-20

B. Sc. Agriculture (Honors) Syllabus (4th Semester) for 2018-19 & 2019-20**Outline of the Syllabus for semester-IV**
B.Sc. Agriculture (Hons.) Course (Semester System)
Semester-IV

Paper code	Subject	Periods per week		Marks		Internal assessment		Total marks		Grand Total
		Theory	Practical	Theory	Practical	Theory	Practical	Theory	Practical	
Agron -401	Principles of Agronomy-II (Rabi Crops)	3	1	30	25	20	-	50	25	75
Econ -402	Production Economics, Farm Management and Agricultural Finance	3	1	30	25	20	-	50	25	75
Ento -403	Insect Ecology and Integrated Pest Management	3	1	30	25	20	-	50	25	75
Lpm -404	Livestock Production and Management	3	1	30	25	20	-	50	25	75
Bot -405	Principles of Seed Technology	3	1	30	25	20	-	50	25	75
Extn -406	Fundamentals of Rural Sociology and Educational Psychology	3	-	30	-	20	-	50	-	50
Path -407	Diseases of Field Crops and their Management	3	1	30	25	20	-	50	25	75
Soils -408	Organic Farming	3	1	30	25	20	-	50	25	75
Soils -409	Fundamentals of Soil and Water Conservation Engineering	3	1	30	25	20	-	50	25	75
Total		27	8	270	200	180	-	450	200	650

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B.Sc. AGRICULTURE (HONS.) Semester – IV

Agron - 401: Principles of Agronomy- II (Rabi Crops)

Max. Marks: 75

Theory: 50

External assessment: 30

Internal assessment: 20

Practical: 25

Periods per Week 3+1

Instructions for the Paper Setters

The question paper will consist of three sections A, B and C. Section-A will have four questions from unit-I of the syllabus and section-B will have four questions from unit-II of the syllabus carrying 6 marks each. Student 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 1/2 mark for each question. All questions of Section-C are compulsory.

Theory

UNIT-I

Production technology of Wheat, Barley, Chickpea, Lentil, Peas, French bean and Rapeseed.

UNIT-II

Production technology of Mustard, Sunflower, Safflower, Linseed, Sugarcane, Sugarbeet, Potato, Tobacco and Forage crops - Berseem, Lucerne and Oats. National and International Agricultural Research Institutes in India.

Practical

Agron - 401: Principles of Agronomy- II (Rabi Crops)

Total marks: 25

Period per week: 1

1. Study of manures, fertilizers and green manure crops.
2. Study of intercultural implements.
3. Methods of fertilizer application.
4. Seed bed preparation and sowing of wheat, sugarcane and sunflower.
5. Calculations of seed and fertilizer for a given area.
6. Identification of weeds in wheat and grain legumes.
7. Morphological characteristics of wheat, sugarcane, chickpea and mustard.

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8. Yield components of wheat and sugarcane.

Suggested Books

1. Singh C, Singh P and Singh R. 2015. Modern Techniques of Raising field crops. Oxford and IBH Publishing Co. New Delhi
2. Reddy, S. R. 2000. Principles of Agronomy. Kalyani Publication Ludhiana.
3. Katyayan, A. 2016. Fundamental of Agriculture. Kaushal Pulsation and Distribution House Varansi.
4. Prashad R. 2015. Text Book of field crops production (Vol.-I). ICAR New Delhi.

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B.Sc. AGRICULTURE (HONS.) Semester – IV

Ento - 403: Insect Ecology and Integrated Pest Management

Max. Marks: 75

Theory: 50

External assessment: 30

Internal assessment: 20

Practical: 25

Periods per Week 3+1

Instructions for the Paper Setters

The question paper will consist of three sections A, B and C. Section-A will have four questions from unit-I of the syllabus and section-B will have four questions from unit-II of the syllabus carrying 6 marks each. Student 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 1/2 mark for each question. All questions of Section-C are compulsory.

Theory

UNIT-I

Introduction to insect ecology and environment and its components, effect of abiotic and biotic factors. Biotic potential, environmental resistance and causes for pest outbreaks in agroecosystem. Pest surveillance and pest forecasting. Categories of pests. Host plant resistance. Cultural, mechanical, physical, legislative and biological control. Chemical control - importance, hazards and limitations. IPM its tools and limitations. Insecticides Act 1968. Symptoms of poisoning, first aid and antidotes. Beneficial insects. Important species of pollinators. Weed killers and scavengers, their importance. Non insect pests - mites, rodents and birds.

UNIT-II

Classification, toxicity and formulations of insecticides. Study of important insecticides- botanical, organophosphates, carbamates, synthetic pyrethroids. Novel insecticides, pheromones, nicotiny, chitin synthesis inhibitors, phenyl pyrazoles, avermectins, macrocyclic lactones, oxadiazines, thiourea derivatives, pyridine azomethines, pyroles, etc. Rodenticides, acaricides and fumigants. Recent methods of pest control. Knowledge about insecticides which have been banned- manufacturer and sales. Effect of insecticides on non-target organisms.

Practical

Ento - 403: Insect Ecology and Integrated Pest Management

Total marks: 25

Period per week: 1

1. Study of terrestrial and pond ecosystems, behaviour, orientation, distribution patterns of insects
2. Sampling techniques for the estimation of insect population and damage.
3. Pest surveillance through insect traps.
4. Practicable IPM practices.

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5. Insecticides and their formulations, calculation of doses of insecticides.
6. Compatibility of pesticides.
7. Phytotoxicity of insecticides.
8. IPM case studies.
9. Identification of common phytophagous mites, rodent, bird pests and their damage.
10. Study of beneficial insects-pollinators, weed killers and scavengers.

Suggested Books

1. G. Raghavaiah and T. Ramesh Babu. Insect Ecology and Integrated Pest Management. Westville Publishing House. New Delhi.
2. Dr. Mathur and Dr. Upadhyay. A text Book of Entomology. Aman Publishing House. New Delhi.
3. R. Arora. Integrated Pest Management. Scientific Publisher
4. A.S. Atwal and G.S. Dhaliwal .Agricultural pest. Kalyani Publisher

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B.Sc. AGRICULTURE (HONS.) Semester – IV

LPM - 404: Livestock Production and Management

Max. Marks: 75

Theory: 50

External assessment: 30

Internal assessment: 20

Practical: 25

Periods per Week 3+1

Instructions for the Paper Setters

The question paper will consist of three sections A, B and C. Section-A will have four questions from unit-I of the syllabus and section-B will have four questions from unit-II of the syllabus carrying 6 marks each. Student 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 1/2 mark for each question. All questions of Section-C are compulsory.

Theory

UNIT-I

Introduction, Importance of livestock in the national economy and breeds of india. Important exotic and Indian breeds of cattle, buffalo, sheep, goat and swine. Measures and factors affecting fertility in livestock. Reproductive behaviour, estrous cycle, detection of estrous. Artificial Insemination (AI), pregnancy and parturition in various livestock species. Care of pregnant animal and new born young one. Physiology of milk secretion and different milking methods. Factors affecting milk yield and composition. Livestock development programmes of Govt. of India and Punjab Govt..

UNIT-II

Selection procedure and various systems of breeding in livestock. Housing and feeding management of calves, heifers, pregnant and milch animals. Feeding and management of sheep, goat, and duck. Piggery, turkey, patridge and hatchery. Principles of housing for livestock. Economics of various livestock enterprises. Vaccination and prevention of important diseases of livestock and poultry. Important breeds of poultry, egg formation, abnormal eggs and factors affecting egg size. Egg and egg products. Moulting, incubation, hatching and brooding. Housing, breeding, feeding and management of poultry. Biotechnological interventions in animal production and reproduction. Pest control measures.

Practical

LPM - 405: Livestock Production and Management

Total marks: 25

Period per week: 1

1. Visit to livestock farms and breed identification.
2. Study of external body parts.
3. Handling and restraining of animals.

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4. Judging of animals.
5. Milking methods.
6. Feeding and ration formulation.
7. Study of different type of dehorning methods.
8. Record keeping.
9. Study of reproductive organs and artificial insemination in cattle and buffaloes.
10. Study of physiological norms.
11. Hatching, housing and management of poultry.

Suggested Books

1. N. S. R. Sastry, C.K. Thomas. Livestock Production Management. Kalyani Publisher -4th edition 2005
2. G. C. Benarjee. A Text book of Animal Husbandry. Oxford & IBH publishing Co Pvt. Ltd-9th edition
3. Jagdish Prasad. Animal Husbandry and Dairy Science. Kalyani Publisher -1th edition 2009
4. R.A. Singh. Poultry Production. Kalyani Publisher -3rd edition 2011

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Bot - 405: Principles of Seed Technology

Max. Marks: 75

Theory: 50

External assessment: 30

Internal assessment: 20

Practical: 25

Periods per Week 3+1

Instructions for the Paper Setters

The question paper will consist of three sections A, B and C. Section-A will have four questions from unit-I of the syllabus and section-B will have four questions from unit-II of the syllabus carrying 6 marks each. Student 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 1/2 mark for each question. All questions of Section-C are compulsory.

Theory

UNIT-I

Importance of seed production. Certified, foundation and breeder seed production. Maintenance of genetic purity. Seed quality and classes of seed, maintenance and multiplication of pre-release and newly released varieties of self and cross-pollinated crops. Isolation distance and roging. Seed production for composite and hybrids in maize, bajra and sorghum, rice (varieties and hybrids) castor, tomato, brinjal, chillies, okra, onion, bottle gourd and ridge gourd.

UNIT-II

Seed certification. Seed act and its enforcement. Intellectual property rights. Patenting, WTO, plant breeders rights. Principle and methods of seed drying. Seed processing. Planning and layout of seed processing plant. Grading equipment's and their use. Seed testing procedures for quality assessment. Seed treatment and its importance. Seed packing and storage. Seed marketing and organizational set up.

Practical

Bot - 405: Principles of Seed Technology

Total mark: 25

Period per week: 1

1. Seed sampling principles and procedures.
2. Determination of physical purity,
3. Determination of germination percentage of vegetable seed
4. Study of seed moisture, viability and health
5. Determination of seed vigour of field and horticulture crops.
6. Study of seed dormancy and its breaking methods.
7. Grow-out tests and electrophoresis for varietal identification.

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8. Visit to seed production plots, testing laboratories, processing plants, grow-out testing farms and hybrid seed production farms.

Suggested Books

- Agrawal, R. L. 1980. Seed Technology. Oxford and IBH Publishing Co. New Delhi.
- Joshi, A. K and Singh B. D. 2012. Seed Science and technology. Kalyani Publication Ludhiana
- Agrawal P.K. and Dadlani, M. 1987 Techniques in Seed Science and technology. South Asian Publisher New Delhi.

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B.Sc. AGRICULTURE (HONS.) Semester – IV

Extn - 406: Fundamentals of Rural Sociology and Educational Psychology

Time: 3 Hours

Max. Marks: 50

External: 30

Internal assessment: 20

Periods per Week 3+0

Instructions for the Paper Setters

The question paper will consist of three sections A, B and C. Section-A will have four questions from unit-I of the syllabus and section-B will have four questions from unit-II of the syllabus carrying 6 marks each. Student 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 1/2 mark for each question. All questions of Section-C are compulsory.

Theory

UNIT-I

Introduction and importance of rural sociology in agricultural extension. Indian rural society. Social groups. Factors in formation and organization of groups. Motivation in group formation and role of social groups in agricultural extension. Social stratification. Class, caste system, culture, customs, folkways, mores, taboos, rituals, traditions, social values and attitudes-meaning and role in agricultural extension.

UNIT-II

Functions and role of social institutions. Social organizations. Social control, social change and their factors. Leadership, different methods of identification of leaders and their training. Scope and importance of educational psychology. Intelligence and personality. Teaching-learning process. Principles of learning and their implications for teaching.

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Path - 407: Diseases of Field Crops and their Management

Max. Marks: 75

Theory: 50

External assessment: 30

Internal assessment: 20

Practical: 25

Periods per Week 3+1

Instructions for the Paper Setters

The question paper will consist of three sections A, B and C. Section-A will have four questions from unit-I of the syllabus and section-B will have four questions from unit-II of the syllabus carrying 6 marks each. Student 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 1/2 mark for each question. All questions of Section-C are compulsory.

Theory

UNIT-I

Economic importance, symptoms, causal organism, epidemiology, disease cycle and integrated management of diseases of Rice, Sorghum, Bajra, Maize, Wheat, Barley, Sugarcane, Turmeric, Tobacco, Groundnut.

UNIT-II

Economic importance, symptoms, causal organism, epidemiology, disease cycle and integrated management of diseases of Sesamum, Castor, Sunflower, Rapeseed, Mustard, Cotton, Pulses, Mentha and Berseem.

Practical

Path - 407: Diseases of Field Crops and their Management

Total marks: 25

Period per week: 1

1. Study of symptoms and host-parasite relationships of important diseases of major and minor field crops.
2. Field visits at appropriate time during the semester.
3. To identify the disease symptoms in different crops.
4. Spray of fungicides for the control of disease.
5. Seed treatment.

Suggested Books

1. R.S. Singh. Plant Disease. Oxford & IBH Publishing.
2. George.N. Agrios. Plant Pathology. Elsevier Academic Press Publication
3. Ashok Aggarwal and R.S. Mehrotra. Plant Pathology (2nd Edition) Published by McGraw Hill Education.

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B.Sc. AGRICULTURE (HONS.) Semester – IV

Soils - 408: Organic Farming

Max. Marks: 75

Theory: 50

External assessment: 30

Internal assessment: 20

Practical: 25

Periods per Week 3+1

Instructions for the Paper Setters

The question paper will consist of three sections A, B and C. Section-A will have four questions from unit-I of the syllabus and section-B will have four questions from unit-II of the syllabus carrying 6 marks each. Student 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 1/2 mark for each question. All questions of Section-C are compulsory.

Theory

UNIT-I

Organic farming- introduction, concept, relevance in the present context. Organic production requirements. Biofertilizers, Biopesticides, Manures, Compost and Vermicompost. Biological intensive nutrient management. Recycling of organic residues. Soil improvement and amendments.

UNIT-II

Integrated diseases and pest management. Use of biocontrol agents, biopesticides, pheromones, trap crops and bird perches. Weed management. Quality considerations - certification, labeling and accreditation process, marketing and exports.

Practical

Soils - 408: Organic Farming

Total marks: 25

Period per week: 1

1. Raising of vegetable crops through organic sources.
2. Diseases and pest management through organic sources.
3. Study of Vermi-composting.
4. Study of vegetable and ornamental nursery raising.

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5. Macro quality analysis.
6. Study of Grading, packaging and post-harvest management.

Suggested Books

1. Claude A, Vandana S, Sultan I, Vijaya L, Korah M & Bernard D. 2000. The Organic Farming Reader. Other Indian Press, Goa.
2. Gaur AC, Neblakantan S and Dargan KS. 1984 Organic Manures. ICAR
3. Palaniappan and Annadurai. 2008. Organic Farming- Theory and Practise. Scientific Publ.
4. Reddy S.R. 2017 Principles of Organic Farming. Kalyali Publication Ludhiana.

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Soils - 409: Fundamentals of Soil and Water Conservation Engineering

Max. Marks: 75

Theory: 50

External assessment: 30

Internal assessment: 20

Practical: 25

Periods per Week 3+1

Instructions for the Paper Setters

The question paper will consist of three sections A, B and C. Section-A will have four questions from unit-I of the syllabus and section-B will have four questions from unit-II of the syllabus carrying 6 marks each. Student 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 1/2 mark for each question. All questions of Section-C are compulsory.

Theory

UNIT-I

Surveying-survey equipments, chain survey. Plotting procedure. Calculations of area of regular and irregular fields. Leveling- equipment, terminology, methods of calculation, types of leveling and contouring. Water harvesting, Watershed management. Irrigation- classification of projects, flow irrigation and lift irrigation. Surface, drip and sprinkler irrigation methods.

UNIT-II

Water sources. Water lifting devices-pumps, their capacity and power calculations. Irrigation water measurement-weirs, flumes and orifices. Water conveyance systems-open channel and underground pipeline. Soil and water conservation, soil erosion, types and control measures.

Practical

Soils - 409: Fundamentals of Soil and Water Conservation Engineering

Total marks: 25

Period per week: 1

1. Acquaintance with chain survey equipment.
2. Ranging and measurement of offsets.
3. Chain triangulation and plotting.
4. Leveling equipment.
5. Differential leveling.
6. Profile leveling.
7. Contour survey and plotting.
8. Study of centrifugal pumping system and irrigation water measuring devices.
9. Surface irrigation methods.

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10. Study of different components of sprinkler and drip irrigation systems.
11. Uniformity of water application in drip and sprinkler systems.
12. Study of soil and water conservation measures.

Suggested Books

1. Blanco-Canqui Humberto, Rattan Lal. 2008. Principles of Soil Conservation and Management Springer Netherlands.
2. Kapur Selim Eswaran Hari, Winfried E.H. Blum.2011. Sustainable Land Management. Springer-Verlag Berlin Heidelberg.
3. Khalid Hakeem, Akhtar, Rehman, Sayeed Mohd. 2016. Plant, Soil and Microbes. Springer International Publishing.Switzerland.