

**B.Sc. Agriculture (Honors) Syllabus (I<sup>st</sup> 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 (Honors) First Year**

**(I<sup>st</sup> Semester)**



**Academic Session 2018-2019 & 2019-2020**

**B.Sc. Agriculture (Honors) Syllabus (1<sup>st</sup> Semester) for 2018-19 & 2019-20****Outline of the Syllabus for Semester-I**  
B.Sc. Agriculture (Hons.) Course (Semester System)  
**Semester-I**

Paper Code	Subject	Periods per week		Marks		Internal assessment		External marks		Grand Total
		Theory	Practical	Theory	Practical	Theory	Practical	Theory	Practical	
<b>AGRON-101</b>	Introductory Agriculture	<b>3</b>	<b>1</b>	<b>75</b>	<b>25</b>	<b>20</b>	<b>0</b>	<b>55</b>	<b>25</b>	<b>100</b>
<b>AGRON -102</b>	Introductory Agro meteorology	<b>3</b>	<b>1</b>	<b>75</b>	<b>25</b>	<b>20</b>	<b>0</b>	<b>55</b>	<b>25</b>	<b>100</b>
<b>MICRO -103</b>	Elementary Microbiology	<b>3</b>	<b>1</b>	<b>75</b>	<b>25</b>	<b>20</b>	<b>0</b>	<b>55</b>	<b>25</b>	<b>100</b>
<b>SOILS -104</b>	Introduction to Soil Science	<b>3</b>	<b>1</b>	<b>75</b>	<b>25</b>	<b>20</b>	<b>0</b>	<b>55</b>	<b>25</b>	<b>100</b>
<b>ECON-105</b>	Elementary Agricultural Economics	<b>4</b>	<b>0</b>	<b>50</b>	<b>0</b>	<b>20</b>	<b>0</b>	<b>30</b>	<b>0</b>	<b>50</b>
<b>MATH-106</b>	Basic Mathematics	<b>4</b>	<b>0</b>	<b>75</b>	<b>0</b>	<b>30</b>	<b>0</b>	<b>45</b>	<b>0</b>	<b>75</b>
<b>BOT-106</b>	Basic Botany	<b>3</b>	<b>1</b>	<b>75</b>	<b>25</b>	<b>20</b>	<b>0</b>	<b>55</b>	<b>25</b>	<b>100</b>
<b>ENG-107</b>	English Communication Skills	<b>3</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>40</b>	<b>0</b>	<b>60</b>	<b>0</b>	<b>100</b>
<b>PBI-108</b>	Punjabi Compulsory	<b>3</b>	<b>0</b>	<b>50</b>	<b>0</b>	<b>20</b>	<b>0</b>	<b>30</b>	<b>0</b>	<b>50</b>
<b>HORT-109</b>	Fundamentals of Horticulture	<b>3</b>	<b>1</b>	<b>75</b>	<b>25</b>	<b>20</b>	<b>0</b>	<b>55</b>	<b>25</b>	<b>100</b>
<b>Total</b>		<b>32</b>	<b>6</b>	<b>725</b>	<b>150</b>	<b>230</b>	<b>0</b>	<b>495</b>	<b>150</b>	<b>875</b>

**B.Sc. Agriculture (Honors) Syllabus (I<sup>st</sup> Semester) for 2018-19 & 2019-20**

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

**Agron-101: Introductory Agriculture**

**Max. Marks: 100**

**Theory: 75**

**(External: 55+ Internal assessments: 20)**

**Practical: 25**

**Periods per Week 3+1**

**INSTRUCTIONS FOR THE PAPER SETTERS/CANDIDATES**

The question paper will consist of three sections A, B and C. Section-A and B will have four questions from the respective sections of the syllabus and carry 11 marks each. Section - C will consist of 11 short answer type questions which will cover the entire syllabus uniformly and will carry one mark for each. Candidates are required to attempt two questions each from sections A and B of the question paper and the entire Section-C.

**Theory**

**Unit-I**

1. Agriculture, concept, definition, branches and role agriculture in economic development. Art, science and business of crop production. History of agricultural development.
2. Ancient Indian agriculture in civilization era. Chronological agricultural technology development in India.
3. Different agricultural related revolutions in India (green, yellow, blue, white, silver etc).
4. Research institute related to agriculture.

**Unit-II**

1. Basic elements and factors affecting crop production.
2. Diversity in physiographic- soil groups, marine, livestock and water. Crop & weed and their classification.
3. Dry and irrigated agriculture. Cropping system and Farming systems approach.
4. Nutritional and rural life standards.

**Practical**

**Agron-101: Introductory Agriculture**

**Total marks: 25**

**Period per week-1**

1. Identification of various crops and their seeds.
2. Weeds - identification and control measures.
3. Use of agricultural implements.
4. Calibration of seed drills.
5. Identification of fertilizers.
6. Computation of doses and methods of application of fertilizer.
7. Farm visit for acquaintance with field problems.

**Suggested readings:**

1. Vyas A. K. 2008. Introductory Agriculture. Jain Brothers.
2. Chandrasekaran B. 2010. A Textbook of Agronomy. Distant Production House University.
3. Hand Book of Agriculture, ICAR Publications

**B.Sc. Agriculture (Honors) Syllabus (I<sup>st</sup> Semester) for 2018-19 & 2019-20**  
B.Sc. AGRICULTURE (HONS.) Semester – I  
**Agron-102: Introductory Agro meteorology**

**Max. Marks: 100**

**Theory: 75**

**(External: 55+ Internal assessments: 20)**

**Practical: 25**

**Periods per Week 3+1**

**INSTRUCTIONS FOR THE PAPER SETTERS/CANDIDATES**

The question paper will consist of three sections A, B and C. Section-A and B will have four questions from the respective sections of the syllabus and carry 11 marks each. Section - C will consist of 11 short answer type questions which will cover the entire syllabus uniformly and will carry one marks for each. Candidates are required to attempt two questions each from sections A and B of the question paper and the entire Section-C.

**Theory**

**Unit-I**

1. Agro-meteorology- Definition, practical utility and scope. General climatology. Structure and composition of earth's atmosphere.
2. Elements and factors of weather and climate - temperature, pressure, wind, solar radiation and moisture.
3. Impact of climate on crops and livestock distribution and production.
4. Agro climatic indices – definitions and applications in agriculture. Remote sensing.

**Unit-II**

1. Effect of environmental factors on crop growth. Weather hazards in agriculture.
2. Climatic classifications. Agro climatic regions of Punjab and India.
3. Basics of field microclimate modification. Introduction to monsoons.
4. Elementary aspects of weather forecasting. Effects of climate change on agriculture.

**Practical**

**Agron-102: Introductory Agrometeorology**

**Total marks: 25**

**Period per week-1**

1. Site selection for agro meteorological observatory.
2. Project on setting up, recording and maintenance of instruments in a meteorological observatory.
3. Measurement of temperature rainfall, and relative humidity.
4. Measurement of evaporation, atmospheric pressure, sunshine duration, solar radiation, wind direction, wind speed.
5. Processing, presentation and interpretation of climatic data in relation to crops.

**Suggested Readings**

1. Khadekar, S.R. 2001. Meteorology. Agromet publishers, Nagpur Prasada Rao,
2. G.S.L.H.V. 2005. Agricultural Meteorology. Second Edition. Keral Agricultural University, Thrissur. Varshneya,
3. M.C. and Balakrishna Pillai, B. 2003. Textbook of Agricultural Meteorology. ICAR, New Delhi.
4. H .S. Mavi 1994. Introduction of Agrometeorology. 2nd Edition Oxford IBH
5. Reddy SR. 2000. *Principles of Crop Production*. Kalyani.

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B.Sc. AGRICULTURE (HONS.) Semester – I  
**Micro-103: Elementary Microbiology**

**Max. Marks: 100**

**Theory: 75**

**(External: 55+ Internal assessments: 20)**

**Practical: 25**

**Periods per Week 3+1**

**INSTRUCTIONS FOR THE PAPER SETTERS/CANDIDATES**

The question paper will consist of three sections A, B and C. Section-A and B will have four questions from the respective sections of the syllabus and carry 11 marks each. Section - C will consist of 11 short answer type questions which will cover the entire syllabus uniformly and will carry one marks for each. Candidates are required to attempt two questions each from sections A and B of the question paper and the entire Section-C.

**Theory**

**Unit-I**

1. History of Microbiology – its application Discovery of microorganisms and their role in fermentation. Germ theory of disease and protection.
2. Structure of eukaryotic and prokaryotic cell. Major groups of eukaryotes – fungi, algae and protozoa.
3. Major groups of prokaryotes - actinomycetes, cyanobacteria, arhaebacteria, rickettsias and chlamydia.
4. Bacterial growth. Metabolism in bacteria – ATP generation.

**Unit-II**

1. Chemoautotrophy, photoautotrophy, respiration, fermentation. Bacteriophages – structure and properties, lytic and lysogenic cycles, viriods, prions.
2. Genetic recombination. Microbial groups in soil. Role of micro-organism.
3. Carbon, nitrogen, phosphorus and sulphur cycles.
4. Biological nitrogen fixation. Microbiology of water and food. Beneficial microorganisms in agriculture – biofertilizers, microbial pesticides. Biodegradation. Biogas production. Bio-herbicides(weed control), biological agents.

**Practical**

**Micro – 103: Elementary Microbiology**

**Total marks: 25**

**Period per week-1**

1. Familiarization with instruments and other materials in a microbiology laboratory.

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2. Practice of aseptic methods on nutrient broth, slants and agar plate.
3. Methods of sterilization and preparation of media and glassware.
4. Sterilization of nutrient broth by filtration.
5. Plating methods for isolation and purification of bacteria.
6. Identification of bacteria by staining methods.
7. Enumeration of bacteria by staining, pour plate and spread plate methods.

**Suggested Reading**

1. Dubey R C & Maheshwari D K (2013) A Textbook of Microbiology, S. Chand Publishing House, New Delhi.
2. Pelczar M, Chan E C S & R D Reid (1998) Microbiology Tata McGraw-Hill Education, New Delhi.
3. Singh R P 2004. General Microbiology, Kalyani Publishers, New Delhi.

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

**Soils-104: Introduction to Soil Science**

**Max. Marks: 100**

**Theory: 75**

**(External: 55+ Internal assessments: 20)**

**Practical: 25**

**Periods per Week 3+1**

**INSTRUCTIONS FOR THE PAPER SETTERS/CANDIDATES**

The question paper will consist of three sections A, B and C. Section-A and B will have four questions from the respective sections of the syllabus and carry 11 marks each. Section - C will consist of 11 short answer type questions which will cover the entire syllabus uniformly and will carry one marks for each. Candidates are required to attempt two questions each from sections A and B of the question paper and the entire Section-C.

**Theory**

**Unit-I**

1. Concept of land, soil and soil science. Composition of earth crust and its relationship with soils. Rocks and minerals. Weathering. Soil forming factors and processes.
2. Soil profile. Soil colour. Elementary knowledge of taxonomic classification of soils. Soils of Punjab and India.
3. physical properties of soil. Soil texture, textural classes. bulk density and particle density of soils and porosity, their significance and manipulation.
4. Soil structure- classification, soil aggregation and significance, soil consistency, soil crusting.

**Unit-II**

1. Soil colloids, properties, nature, types and significance. Sources of charges in clay minerals.
2. Ion exchange, CEC, AEC – factors affecting and adsorption of ions.
3. Soil organic matter, decomposition, mineralization, humus. Carbon cycle, C: N ratio.
4. Soil organisms and their beneficial and harmful roles.

**Practical**

**Soils-104: Introduction to Soil Science**

**Total marks: 25**

**Period per week-1**

1. Determination of moisture content, bulk density and particle density.
2. Aggregate size analysis.
3. Soil mechanical analysis.
4. Analytical chemistry- basic concepts, techniques and calculations.



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5. Collection and processing of soil samples for analysis of organic carbon, pH, EC, available N, P, K and S. Study of a soil profile.
6. Identification of rocks and minerals.

**Suggested readings**

1. Brady NC & Weil RR. 2002. The Nature and Properties of Soils. 13th Ed. Pearson Edu.
2. Kabata-Pendias A & Pendias H. 1992. Trace Elements in Soils and Plants. CRC Press.
3. Kannaiyan S, Kumar K & Govindarajan K. 2004. Biofertilizers Technology. ScientificPubl.
4. Leigh JG. 2002. Nitrogen Fixation at the Millennium. Elsevier.
5. Mengel K & Kirkby EA. 1982. Principles of Plant Nutrition. International PotashInstitute, Switzerland.
6. Mortvedt JJ, Shuman LM, Cox FR & Welch RM. 1991. Micronutrients in Agriculture. 2nd Ed. SSSA, Madison.

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

**HORT-109 Fundamentals of Horticulture**

**Max. Marks: 100**

**Theory: 75**

**(External: 55+ Internal assessments: 20)**

**Practical: 25**

**Periods per Week 3+1**

**INSTRUCTIONS FOR THE PAPER SETTERS/CANDIDATES**

The question paper will consist of three sections A, B and C. Section-A and B will have four questions from the respective sections of the syllabus and carry 11 marks each. Section - C will consist of 11 short answer type questions which will cover the entire syllabus uniformly and will carry one marks for each. Candidates are required to attempt two questions each from sections A and B of the question paper and the entire Section-C.

**Theory**

**Unit-I**

1. Horticulture-Its definition and branches, importance and scope; horticultural and botanical classification
2. Climate and soil for horticultural crops.
3. Plant propagation-methods and propagating structures principles of orchard establishment;
4. Principles and methods of training and pruning,

**Unit-II**

1. Bahar treatment, juvenility and flower bud differentiation; unfruitfulness; pollination, pollinizers and pollinators.
2. fertilization and parthenocarpy; kitchen gardening; garden types and parts.
3. Lawn making; use of plant bio-regulators in horticulture.
4. Irrigation & fertilizers application-method and quantity

**Practical**

1. Identification of garden tools.
2. Identification of horticultural crops.
3. Preparation of seed bed/nursery bed.
4. Practice of sexual and asexual methods of propagation.
5. Layout and planting of orchard plants.

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6. Training and pruning of fruit trees.
7. Transplanting and care of vegetable seedlings.
8. Making of herbaceous and shrubby borders.
9. Preparation of potting mixture, potting and repotting.
10. Fertilizer application in different crops.
11. Visits to commercial nurseries/orchard.

**Suggested readings:**

1. Peter KV. 2008. (Ed.). *Basics of Horticulture*. New India Publ. Agency
2. Singh J. 2016. (Ed.). *Basic Horticulture*. Kalyani Publisher.
3. Hartmann HT & Kester DE. 1989. *Plant Propagation – Principles and Practices*. Prentice Hall of India.
4. Pradeepkumar T, Suma B, Jyothibhaskar & Satheesan KN. 2007. *Management of Horticultural Crops*. Parts I, II. New India Publ. Agency