

**PUNJABI UNIVERSITY PATIALA**  
(Established under Punjab Act No. 35 of 1961)

**DIPLOMA IN AGRICULTURE**

**2 Year Course**  
**Part-1(Semester I & II)**

**For**  
**Session: 2018-19**

**PUNJABI UNIVERSITY PATIALA**

**DIPLOMA IN AGRICULTURE**

**Part-I (Semester-I)**

**SESSION 2018-19**

**SCHEME OF STUDY**

Code	Title of paper	Hours per week		Credits		Marks for External Examination	Marks For Practical Examination	Internal Assessment	Maximum Marks
		T	P	T	P				
BOT 101	Botany	1	2	1	1	54	25	21	100
AGRON 102	Agronomy	2	2	2	1	54	25	21	100
AGRON 103	Agronomy	2	2	2	1	54	25	21	100
HORT 104	Horticulture	2	2	2	1	54	25	21	100
FORST 105	Forestry	1	2	1	1	54	25	21	100
SOILS 106	Soils	2	2	2	1	54	25	21	100
VEG 107	Vegetable	2	2	2	1	54	25	21	100
	<b>Total</b>	<b>12</b>	<b>14</b>	<b>12</b>	<b>7</b>	<b>378</b>	<b>175</b>	<b>147</b>	<b>700</b>

**Total credits: 19**

In each Theory Paper 25% of the total marks are assigned to the internal assessment and 75% marks to the University examination.

**Internal assessment and its Components:** Internal assessment, in each subject, shall be 25% of the total marks of theory in each paper and shall be uniformly applicable to all the Subjects/Papers. This components for Internal Assessment shall be as follows :

S. No.	Component	Total Marks of the internal Assessment
(i)	Attendance*: *The students with 85%-100% attendance will be given full attendance marks, whereas students with 80%-84.9% attendance shall be given 80% marks of attendance and students with 75%-80% shall get 60% of attendance marks.	20%
(ii)	Written Assignment/Project	40%
(iii)	Two Mid-Semester Tests/Internal Examination (Average of both Mid-Semester Tests/Internal Examination)	40%

## DIPLOMA IN AGRICULTURE

### Part-I (Semester-II)

SESSION 2018-19

### SCHEME OF STUDY

Code	Title of paper	Hours per week		Credits		Marks for External Examination	Marks For Practical Examination	Internal Assessment	Maximum Marks
		T	P	T	P				
AGRON 201	Agronomy	2	1	2	1	54	25	21	100
LPM 202	Livestock and Poultry Management	3	1	3	1	54	25	21	100
SOILS 203	Soils	2	1	2	1	54	25	21	100
FT 204	Food Technology	1	1	1	1	54	25	21	100
FLORI 205	Floriculture	1	1	1	1	54	25	21	100
AGROM ET 206	Agro-climatology	1	1	1	1	54	25	21	100
ECON 207	Economics	2	1	2	1	54	25	21	100
	<b>Total</b>	<b>12</b>	<b>7</b>	<b>12</b>	<b>7</b>	<b>378</b>	<b>175</b>	<b>147</b>	<b>700</b>

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(ii)	Written Assignment/Project	40%
(iii)	Two Mid-Semester Tests/Internal Examination (Average of both Mid-Semester Tests/Internal Examination)	40%

**DIPLOMA IN AGRICULTURE**  
**Part-I (Semester-I)**

**PAPER: BOT 101**

Max. Marks : 75  
Duration of the Paper: 3hrs  
Pass Marks: 35%

Theory : 54  
Internal Assessment: 21  
Credits : 1

**INSTRUCTIONS FOR PAPER SETTER**

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 will carry 8 marks each. Section C will consist of 11 short answer type questions which will cover the entire syllabus uniformly and will carry 22 marks in all.

**INSTRUCTIONS FOR CANDIDATES**

Candidates are required to attempt two questions from each section A and B and the entire section C.

**Section-A**

An introduction to plant Kingdom. Morphology features of a flowering plants. Structure of root and stem and their various modifications. Parts of leaf, simple and compound leaf, phyllotaxy, venation and modification of leaf, Types of inflorescence and fruits.

**Section-B**

Reproductive system in flowering plants – flower morphology, pollination and double fertilization: Structure of monocot and dicot seed. Types of seed germination. Characteristics features and economic importance of families- Brassicaceae, Cucurbitaceae, Papilionaceae, Mulvaceae, Rutacace, Solanaceae and Poaceae. A brief account of interaction of plants with environment.

**PRACTICAL**

Max. Marks: 25  
Credits : 1

Duration of the Paper: 3hrs

Study of one specimen from each group of plant kingdom. Morphology of root and stem and their modification. Parts of leaf, types of leaf, phyllotaxy, venation and modification of leaf. Racemose, cymose and special types of inflorescence. Different types of fruits. Structure of monocot and dicot seed. Epigeal and hypogeal germination. Study of one specimen from each of the above mentioned families.

## **DIPLOMA IN AGRICULTURE**

### **Part-I (Semester-I)**

#### **Paper: AGRON102**

Max. Marks : 75

Duration of the Paper: 3hrs

Pass Marks: 35%

Theory : 54

Internal Assessment: 21

Credits : 2

#### **INSTRUCTIONS FOR PAPER SETTER**

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 will carry 8 marks each. Section C will consist of 11 short answer type questions which will cover the entire syllabus uniformly and will carry 22 marks in all.

#### **INSTRUCTIONS FOR CANDIDATES**

Candidates are required to attempt two questions from each section A and B and the entire section C.

##### **Section A**

Agronomy-its importance and relation with other sciences. Classification of crops. Tillage-principles and practices. Different methods of sowing. Common manures and fertilizers and their time and methods of application. Green manuring.

##### **Section B**

Methods of irrigation. Weeds and their control. Cropping systems, crop rotations and inter-cropping. Harvesting and threshing. Conservation agriculture.

##### **PRACTICAL**

Max. Marks: 25

Credits : 1

Duration of the Paper: 3hrs

Land measurements. Use of common hand tools and farm implements. Identification of different fertilizers. Computation of fertilizer doses. Methods of fertilizer application. Germination and purity test. Use of spray pumps. Practice in harvesting and threshing. Farm visit for familiarization with field problems.

## **DIPLOMA IN AGRICULTURE**

### **Part-I (Semester-I)**

#### **Paper: AGRON103**

Max. Marks : 75

Duration of the Paper: 3hrs

Pass Marks: 35%

Theory : 54

Internal Assessment: 21

Credits : 2

#### **INSTRUCTIONS FOR PAPER SETTER**

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 will carry 8 marks each. Section C will consist of 11 short answer type questions which will cover the entire syllabus uniformly and will carry 22 marks in all.

#### **INSTRUCTIONS FOR CANDIDATES**

Candidates are required to attempt two questions from each section A and B and the entire section C.

##### **Section A**

Important *kharif* crops-rice, maize, bajra, cotton, sugarcane, moong, mash. their importance, improved varieties, cultural practices, harvesting and threshing.

##### **Section B**

Red gram, soybean, groundnut, sesamum, mentha, turmeric and fodder crops. their importance, improved varieties, cultural practices, harvesting and threshing.

##### **PRACTICAL**

Max. Marks: 25

Credits : 1

Duration of the Paper: 3hrs

Identification of important *kharif* crops, their seeds and weeds. Field practices like seedbed preparation, seed treatment, preparation of sugarcane seed sets, sowing, transplanting, thinning, earthing up, hoeing, fertilizer and herbicide application, propping, maturing indexing and harvesting.

## **DIPLOMA IN AGRICULTURE**

### **Part-I (Semester-I)**

#### **PAPER : HORT104**

Max. Marks : 75

Duration of the Paper: 3hrs

Pass Marks: 35%

Theory : 54

Internal Assessment: 21

Credits : 2

#### **INSTRUCTIONS FOR PAPER SETTER**

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 will carry 8 marks each. Section C will consist of 11 short answer type questions which will cover the entire syllabus uniformly and will carry 22 marks in all.

#### **INSTRUCTIONS FOR CANDIDATES**

Candidates are required to attempt two questions from each section A and B and the entire section C.

#### **Section-A**

Fruits: Importance, scope and their role in human nutrition. Fruit Zones of Punjab, Planning, Planting and after-care of fruit plants.

#### **Section-B**

Important hints (varieties, soil, irrigation, manuring and fertilization, weed management, training and pruning, harvesting post-harvest handling, insect-pests and diseases) for the cultivation of fruit plants such as citrus, mango, pear, peach, plum, guava, grapes, litchi, loquat, ber, amla and papaya.

#### **PRACTICAL**

Max. Marks: 25

Credits : 1

Duration of the Paper: 3hrs

Identification of different fruit plants. Layout, digging and filling of pits. Planting of young plants and protection from adverse weather conditions. Training and pruning, manuring and fertilization and methods of irrigation to different fruit plants. Identification and management of important diseases and pests of fruit plants.

## **DIPLOMA IN AGRICULTURE**

### **Part-I (Semester-I)**

#### **PAPER : FORST105**

Max. Marks : 75

Duration of the Paper: 3hrs

Pass Marks: 35%

Theory : 54

Internal Assessment: 21

Credits : 1

#### **INSTRUCTIONS FOR PAPER SETTER**

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 will carry 8 marks each. Section C will consist of 11 short answer type questions which will cover the entire syllabus uniformly and will carry 22 marks in all.

#### **INSTRUCTIONS FOR CANDIDATES**

Candidates are required to attempt two questions from each section A and B and the entire section C.

#### **Section-A**

Introduction and importance of forests. State of forest cover and tree-cover. Forestry, farm forestry, social forestry and agro forestry, Overview of national and global agro-forestry systems. Methods of growing trees with crops – boundary/block planting, alley cropping, windbreak/ shelter belts and homestead gardens.

#### **Section-B**

Agro forestry benefits/ limitations and ecological and economic interactions. Choice of trees and crops for combined culture. Fodder, fuel, timber and other multipurpose trees for agro forestry. Environment services of agro forestry plantations. Methods of regeneration, cultural practices and tending operations for agro forestry trees. People participation and role of national/international agencies. Agro forestry policy.

#### **PRACTICAL**

Max. Marks: 25

Credits : 1

Duration of the Paper: 3hrs

Identification of various agro forestry and other important forest trees. D & D exercise. Field layout of boundary/block plantations. Measurements of tree and crop parameters. Propagation and nursery practices for forest trees. Seed collection and handling. Agro forestry farm visits.



## **DIPLOMA IN AGRICULTURE**

### **Part-I (Semester-I)**

#### **PAPER : SOILS106**

Max. Marks : 75

Duration of the Paper: 3hrs

Pass Marks: 35%

Theory : 54

Internal Assessment: 21

Credits : 2

#### **INSTRUCTIONS FOR PAPER SETTER**

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 will carry 8 marks each. Section C will consist of 11 short answer type questions which will cover the entire syllabus uniformly and will carry 22 marks in all.

#### **INSTRUCTIONS FOR CANDIDATES**

Candidates are required to attempt two questions from each section A and B and the entire section C.

##### **Section-A**

Components of soil, Function of soil for plant growth, Rocks and minerals, Weathering, Soil forming factors and processes. Soil profile, Soils of Punjab, Essential nutrients – criteria of essentially, form present in soil, functions and deficiency symptoms, Soil colloids – properties, types and importance.

##### **Section-B**

Ion exchange – CEC and AEC, Organic matter and its mineralization, Soil Organisms and their beneficial and harmful roles. Soil reaction, saline and sodic soils and their reclamation, Fertilizer and manures. Time and method of fertilizer application.

#### **PRACTICAL**

Max. Marks: 25

Credits : 1

Duration of the Paper: 3hrs

Identification of rocks and minerals. Study of soil profile. Visit to soil testing lab. Determination of pH. EC and organic carbon. Gypsum requirement of sodic soils, Identification of fertilizer. Diagnosis of nutrient deficiency symptoms in the field. Collection of soil samples for different purposes. Preparation of farm compost.

## **DIPLOMA IN AGRICULTURE**

### **Part-I (Semester-I)**

#### **PAPER: VEG 107**

Max. Marks : 75  
Duration of the Paper: 3hrs  
Pass Marks: 35%

Theory : 54  
Internal Assessment: 21  
Credits : 2

#### **INSTRUCTIONS FOR PAPER SETTER**

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 will carry 8 marks each. Section C will consist of 11 short answer type questions which will cover the entire syllabus uniformly and will carry 22 marks in all.

#### **INSTRUCTIONS FOR CANDIDATES**

Candidates are required to attempt two questions from each section A and B and the entire section C.

#### **Section-A**

Role of vegetables in human nutrition and agricultural economy. Types of vegetable gardens including home garden, market garden, truck garden, seed garden and processing garden. Roof top cultivation.

#### **Section-B**

Production practices of winter season vegetable crops i.e. potato, cole crops(cabbage, cauliflower, knol khol, broccoli), root crops(radish, carrot, turnip, beetroot), bulb crops(onion, garlic), garden peas, lettuce, palak, methi and summer season vegetable crops i.e. tomato, brinjal, chilli, sweet pepper, okra, beans(cowpeas, French bean, cluster bean.), sweet potato and amaranthus.

#### **PRACTICAL**

Max. Marks: 25  
Credits : 1

Duration of the Paper: 3hrs

Identification of vegetable seeds and crops. Nursery raising, Layout of kitchen garden, Sowing methods of potato, cucurbitaceous and leafy vegetables. Fertilization, irrigation, plant protection measures and weed management. Off-season vegetable production.

## **DIPLOMA IN AGRICULTURE**

### **Part-I (Semester-II)**

#### **Paper: AGRON201**

Max. Marks : 75

Duration of the Paper: 3hrs

Pass Marks: 35%

Theory : 54

Internal Assessment: 21

Credits : 2

#### **INSTRUCTIONS FOR PAPER SETTER**

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 will carry 8 marks each. Section C will consist of 11 short answer type questions which will cover the entire syllabus uniformly and will carry 22 marks in all.

#### **INSTRUCTIONS FOR CANDIDATES**

Candidates are required to attempt two questions from each section A and B and the entire section C.

#### **Section A**

Important *rabi* crops-wheat, winter, maize, gram, lentil, rapeseed and mustard. Their importance, improved varieties, cultural practices, harvesting and threshing.

#### **Section B**

Sunflower, safflower, celery, and fodder crops. Their importance, improved varieties, cultural practices, harvesting and threshing.

#### **PRACTICAL**

Max. Marks: 25

Credits : 1

Duration of the Paper: 3hrs

Identification of important *rabi* crops, their seeds and weeds. Field practices like seedbed preparation, seed treatment, sowing, transplanting, thinning, earthing up, hoeing, fertilizer and herbicide application, maturity indexing and harvesting.

## **DIPLOMA IN AGRICULTURE**

### **Part-I (Semester-II)**

#### **PAPER: LPM202**

Max. Marks : 75

Duration of the Paper: 3hrs

Pass Marks: 35%

Theory : 54

Internal Assessment: 21

Credits : 3

#### **INSTRUCTIONS FOR PAPER SETTER**

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 will carry 8 marks each. Section C will consist of 11 short answer type questions which will cover the entire syllabus uniformly and will carry 22 marks in all.

#### **INSTRUCTIONS FOR CANDIDATES**

Candidates are required to attempt two questions from each section A and B and the entire section C.

#### **Section A**

Importance of livestock and livestock farming. Important breeds of cattle, buffaloes, sheep, goat, swine and poultry, Judging, selection and breeding of livestock for genetic improvement. Reproduction, reproductive behaviour, estrous cycle, detection of estrous, Artificial insemination. Livestock feeding and ration formulation. Silage and hay making. Housing Factors affecting milk yield and composition. Clean milk production.

#### **Section-B**

Care of young ones and adult animals. Composition and formation of an egg. Care and incubation of the eggs. Grading of eggs. Hatchery management. Preparing the animals for marketing. Transportation of animals. Common diseases, their prevention and control. Economics of livestock and poultry enterprises. Livestock development programmes of Govt. of India and State Govt.

#### **PRACTICAL**

Max. Marks: 25

Credits : 1

Duration of the Paper: 3hrs

Handling of various categories of livestock. Breed of livestock and poultry, Methods of restraint. External body parts of animals. Judging of animals. Milking Feed formulation and mixing of concentrate. Management of young ones- feeding tattooing and dehorning. Recording of body weight, temperature and pulses and respiration rates. Study of reproductive organs. Artificial insemination. Cleaning and disinfection of houses. Selection and incubation of hatching eggs. Grading and handling of eggs. Visit to various livestock farms.

## **DIPLOMA IN AGRICULTURE**

### **Part-I (Semester-II)**

#### **PAPER: SOILS 203**

Max. Marks : 75  
Duration of the Paper: 3hrs  
Pass Marks: 35%

Theory : 54  
Internal Assessment: 21  
Credits : 2

#### **INSTRUCTIONS FOR PAPER SETTER**

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 will carry 8 marks each. Section C will consist of 11 short answer type questions which will cover the entire syllabus uniformly and will carry 22 marks in all.

#### **INSTRUCTIONS FOR CANDIDATES**

Candidates are required to attempt two questions from each section A and B and the entire section C.

#### **Section-A**

Soil as a three phase system – components and distribution in surface and subsoil. Soil texture – importance and textural classification. Volumes- mass relationships in soils. Soil Structure – classification. significance and management. Soil-water retention, storage, measurement. Plant available water. Soil water constants. Infiltration.

#### **Section-B**

Soil air- composition and renewal. Soil temperature- thermal properties, diurnal and seasonal variations and management. Soil erosions – significance. Soil erosion – forms, causes. factors affecting. Soil erosion management including gully erosion control. Wind erosion – causes, factors, forms and management including shelterbelts and wind breaks.

#### **PRACTICAL**

Max. Marks: 25  
Credits : 1

Duration of the Paper: 3hrs

Particle size analysis. Dry aggregate size analysis. Determination of bulk and particle density. Determination of soil moisture, soil moisture tension. And water intake in soils. Determination of total and air filled pore spaces. Measurement of soil temperature. Determination of percent surface cover by mulches and crop canopy. Determination of run-off and soil loss. Determination of splash erosion. Visit to soil conservation works.

## **DIPLOMA IN AGRICULTURE**

### **Part-I (Semester-II)**

#### **PAPER : FT204**

Max. Marks : 75

Duration of the Paper: 3hrs

Pass Marks: 35%

Theory : 54

Internal Assessment: 21

Credits : 1

#### **INSTRUCTIONS FOR PAPER SETTER**

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 will carry 8 marks each. Section C will consist of 11 short answer type questions which will cover the entire syllabus uniformly and will carry 22 marks in all.

#### **INSTRUCTIONS FOR CANDIDATES**

Candidates are required to attempt two questions from each section A and B and the entire section C.

#### **Section-A**

Causes of food spoilage, Principles of processing and preservation of food by heat, low temperature, chemicals and fermentation, Preservation through ultraviolet and ionizing radiations.

#### **Section-B**

Post harvest handling and technology of fruits, vegetables, cereals, oilseeds, milk, meat and poultry, Food safety, adulteration and food laws, Status of food industry in India.

#### **PRACTICAL**

Max. Marks: 25

Credits : 1

Duration of the Paper: 3 hrs

Quality assessment of cereals, fruits, vegetables, egg, meat and poultry, Value added products from cereals, fruits, vegetables, milk, egg and meat. Visit to local food processing units.

## **DIPLOMA IN AGRICULTURE**

### **Part-I (Semester-II)**

#### **Paper: FLORI205**

Max. Marks : 75

Duration of the Paper: 3hrs

Pass Marks: 35%

Theory : 54

Internal Assessment: 21

Credits : 1

#### **INSTRUCTIONS FOR PAPER SETTER**

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 will carry 8 marks each. Section C will consist of 11 short answer type questions which will cover the entire syllabus uniformly and will carry 22 marks in all.

#### **INSTRUCTIONS FOR CANDIDATES**

Candidates are required to attempt two questions from each section A and B and the entire section C.

#### **Section-A**

Importance of floriculture in Punjab. Landscape use of ornaments trees, shrubs, climbers and pot plants. Cultivation of seasonal flowers, chrysanthemum, gladiolus. Marigold and rose.

#### **Section-B**

Preparation and maintenance of lawn, Art principles of landscaping, Landscaping of home garden and public parks.

#### **PRACTICAL**

Max. Marks: 25

Credits : 1

Duration of the Paper: 3hrs

Identification of important trees, shrubs, climbers, annuals and pot plants, Raising and transplanting of seedlings of seasonal flowers. Hands-on training for cultivation of chrysanthemum, gladiolus, marigold and rose. Potting and reporting of indoor plants. Propagation of ornamental plants. Establishment of lawn. Visit to landscape nursery.

**DIPLOMA IN AGRICULTURE**  
**Part-I (Semester-II)**

**Paper: AGROMET206**

Max. Marks : 75

Duration of the Paper: 3hrs

Pass Marks: 35%

Theory : 54

Internal Assessment: 21

Credits : 1

**INSTRUCTIONS FOR PAPER SETTER**

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 will carry 8 marks each. Section C will consist of 11 short answer type questions which will cover the entire syllabus uniformly and will carry 22 marks in all.

**INSTRUCTIONS FOR CANDIDATES**

Candidates are required to attempt two questions from each section A and B and the entire section C.

**Section-A**

General Climatology. Agro meteorology. Elements and factors of climate. Earth's atmosphere. Effect of climate on crops and livestock distribution and production.

**Section-B**

Weather hazards on agriculture. Introduction to monsoons. Basics of weather forecasting. Agro-climatic regions of Punjab. Effects of climate change on agriculture.

**PRACTICAL**

Max. Marks: 25

Credits : 1

Duration of the Paper: 3hrs

Introduction to Agrometeorology. Instruments installed in observatory. Recording data in Meteorological Observatory. Preparation of Ergograph. Computation of atmosphere humidity. Analysis of wind using Wind Rose. Study of weather systems. Analysis of weather charts. Preparation and dissemination of weather forecast, Agro advisories.



## **DIPLOMA IN AGRICULTURE**

### **Part-I (Semester-II)**

#### **PAPER: ECON207**

Max. Marks : 75  
Duration of the Paper: 3hrs  
Pass Marks: 35%

Theory : 54  
Internal Assessment: 21  
Credits : 2

#### **INSTRUCTIONS FOR PAPER SETTER**

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 will carry 8 marks each. Section C will consist of 11 short answer type questions which will cover the entire syllabus uniformly and will carry 22 marks in all.

#### **INSTRUCTIONS FOR CANDIDATES**

Candidates are required to attempt two questions from each section A and B and the entire section C.

#### **Section-A**

Farm Management – meaning, scope, importance and relationship with sciences. Farm management decisions. Characteristics of Punjab farms. Concept of package of practices and its application in terms of cost and returns. Simple planning and budgeting procedure.

#### **Section-B**

Farm records. Agricultural finance- nature and significance of agricultural finance. Credit institutions. Capital and credit needs. Classification of farm credit. Use of balance sheet and income statement in credit appraisal. Credit acquisition and repayment schedule.

#### **PRACTICAL**

Max. Marks: 25  
Credits : 1

Duration of the Paper: 3hrs

Preparing farm maps, inventory and farm plan. Maintain of farm records. Visits to regulated markets, ware houses. Cooperative marketing societies and grading laboratories.