Punyashlok Ahilyadevi Holkar Solapur University, Solapur

NAAC Accredited-2022
'B^{++}' Grade (CGPA 2.92)

Name of the Faculty: Science & Technology

As per NEP 2020

Syllabus: Plant Protection

(Additional Interdisciplinary Subject)

Name of the Course: B.Sc. II (Sem– III & IV)

(Syllabus to be implemented w.e.f. June 2025)

Punyashlok Ahilyadevi Holkar Solapur University, Solapur

Faculty of Science and Technology

B. Sc. II NEP Syllabus Structure for Plant Protection Subject w.e.f. June 2025

Level / Difficulty	Sem.	Faculty		Generic/ Open Elective GE/OE	Vocational and Skill Enhancement Courses (SEC/VSC)	Ability Enhancement Course (AEC), IKS,	Field Project/ RP/CC/Internship/ Apprenticeship/ Community Engagement & Services	Credits	Cumulative Credits
		Major	Minor						
5.0/200	III	DSC1-3 (2+1)	DSC2-3 (2+1) Major crops and methods of integrated plant protection	GE 3/OE3 (2) Terrace gardening	**VSC1 (2)** (DSC 1) **VSC2 (2)** (DSC 2) Major crops and methods of integrated plant protection Crop Diseases and their Management	L2-1 (2)	**CC2 (2)**	22	44
		DSC1-4 (2+1)	DSC2-4 (2+1) Crop Diseases and their Management						
	IV	DSC1-5 (2+1)	DSC2-5 (2+1) Introduction to weeds & non insect pests	GE4/ OE4 (2) Analytical Techniques in Plant Sciences	**VSC3 (2)** (DSC1) **VSC4 (2)** (DSC2) Introduction to weeds & non insect pests Insect pests and their Management	L2-2 (2)	FP1 / CEP 1 (2)	22	
		DSC1-6 (2+1)	DSC2-6 (2+1) Insect pests and their management						

Sr. No	Paper Code	Course/Title	Nature	Credit	Marks	
Semester III						
					CA	**UA**
1.	DSC -1 (3)	**Major:**	Theory	2	20	30
2	DSC -1 (4)	**Major:**	Theory	2	20	30
3	DSC 1 (3 & 4)	**Major**:	Practical	1+1	20	30
4	DSC -2 (3)	**Minor:** Major **crops and methods of integrated plant protection**	Theory	2	20	30
5	DSC -2 (4)	**Minor: Crop** Diseases and their Management	Theory	2	20	30
6	DSC 2 (3 & 4)	**Minor:** Practical's	Practical	1+1	20	30
7	GE (3)	**GE:** Terrace Garden	Theory	2	20	30
8	VSC 1		Practical	2	20	30
9	VSC 2	Major crops and methods of integrated plant protection Crop Diseases and their Management	Practical	2	20	30
10	L2-1	English	Theory	2	20	30
11	CC-2			2	20	30
		Semester III: Total credits with marks		**22**	**220**	**330**
		Total Marks				**550**
Semester IV						
1	DSC -1 (5)	**Major:**	Theory	2	20	30
2	DSC -1 (6)	**Major:**	Theory	2	20	30
3	DSC-1 (5 & 6)	**Major:** Practical's	Practical	1+1	20	30
4	DSC -2 (4)	**Minor:** Introduction to weeds & non insect pests	Theory	2	20	30
5	DSC -2 (5)	**Minor:** Insect pests and their Management	Theory	2	20	30
6	DSC-2 (5 & 6)	**Minor:** Practical Introduction to weeds & non insect pests **:** Insect pests and their Management	Practical	1+1	20	30
7	GE (4)	**GE**: Analytical Techniques in Plant Science	Theory	2	20	30
8	VSC 3		Practical	2	20	30
9	VSC 4		Practical	2	20	30
10	L2-1	English	Theory	2	20	30
11	FP	Field Projects	Projects	2	20	30
		Semester IV: Total credits with marks		**22**	**220**	**330**
		Semester III: Total credits with marks		**22**	**220**	**330**
		Total Credits		**44**	**440**	**660**
			Total Marks			**1100**

Note: Nature of Internal examination, passing standard, ATKT and the conversion of marks into grades and credits are as per guidelines of Science Faculty Credit and Grading System.

Punyashlok Ahilyadevi Holkar Solapur University, Solapur
B. Sc. II Botany Syllabus Structure
(NEP 2020)
w.e.f. 2025-26
Proposed Syllabus for B. Sc. Part - II (CBCS Semester Pattern)

PLANT PROTECTION

Introduction:

With a view to ensure worldwide recognition, acceptability, horizontal as well as vertical mobility for students completing undergraduate degree, Solapur University has implemented NEP 2020 The main objective of this course is to introduce NEP 2020 CBCS semester system to the B. Sc-II (Plant Protection) students which covers the basic concepts of **Major crops and methods of integrated plant protection, Crop Diseases and their Management, Introduction to weeds & non insect pests and Insect pests and their Management.**

B. Sc-II (Plant Protection) NEP CBCS Semester wise pattern to be introduced from June 2025. This syllabus of Plant Protection carries 660 marks. In semester-III, the University examination will be of theory papers DSC1-3 and DSC-1-4 and in semester-IV, the University examination will be of theory papers DSC1-5 and DSC1-6 The university examination of practical-I will be based on paper- DSC1-3 DSC-1-4 and practical-II will be based on paper- DSC1-5 DSC1- 6. The practical examination will be held semester wise. The distributions of marks are as below.

Moreover, the grading system of evaluation is introduced for B. Sc. course, wherein process of Continuous Internal Evaluation is ensured. The candidate has to appear for Internal Evaluation of 20 marks and University Evaluation for 8marks. It is 30 + 20 pattern of evaluation. It is applicable for theory and practical as well. The details regarding this evaluation system are as under.

Objectives & outcomes of course syllabus of B.Sc. II, NEP 2020 Pattern

Semester III

Plant Protection–DSC-2- 3: Theory Minor: Major crops and methods of integrated plant protection

Objective- To get the knowledge of significance of plant protection, gross morphology, advanced methods of agriculture practices.

Outcome- Student can understand significance of plant protection, gross morphology and advance methods of agriculture practices.

Objective - To get the knowledge of general methods of plant protection, methods of management insect pest

Outcome- Students can understand general methods of plant protection methods of management insect pest

Minor Plant Protection –DSC-2- 4: Theory- Minor: Crop Diseases and their Management

Objective- To get the knowledge of concept and classification of plant diseases

Outcome- Student can understand concept and classification plant diseases

Objective - To get the knowledge of plant infection, crop diseases and their management, assessment of crop diseases principles of management.

Outcome- Students can understand plant infection, crop diseases and their management, assessment of crop diseases principles of management.

Semester IV

Plant Protection –DSC-2- 5: Theory- Minor: Introduction to weeds & non insect pests

Objective- To get the knowledge of weeds and their classification, special weeds and their management.

Outcome- Students can understand weeds and their classification, special weeds and their management.

Objective- To get the knowledge of non-insect pests.

Outcome- Students can understand non-insect pests.

Plant Protection y–DSC-2- 6: Theory- Minor: Insect pests and their management

Objective- To get the knowledge of insect pests, stored grain pests and their management

Outcome- Students can understand insect pests, stored grain pests and their management

Objective- To get the knowledge of the management of insect pests and recent trends in pest management

Outcome- Students can understand insect pests and recent trends in pest management

Plant Protection y–DSC-2-3,4,5, 6: Practical- Minor:

Objective- To get the practical knowledge of plant protection subject

Outcome- Students can understand the crop diseases, weeds, pesticides, mode of pre-reproduction and dispersal of weeds, insect preservation techniques and preparation of pesticides, chromatography and calibration.

B. Sc. II (PLANT PROTECTION)

w.e.f. June –2025 SEMESTER-III

Teaching scheme – Lecture 2 hrs./ week, 2 credits
Examination scheme UA – 30 marks, CA – 20 Marks

DSC2 -03: Major Crops and Methods of integrated plant protection. 30 Periods

Unit-1: Introduction and Significance of Plant Protection (15)

1.1 Introduction and Significance

1.2 Study of Major Crops of Maharashtra

Crop identification, soil types, tillage, seed rate and spacing, intercultural operations, fertilizers, irrigation, intercropping, yield, and economic importance:

Cereals	Jowar
Oil Seed Crops	Soybean
Pulse Crops	Tur
Cash Crops	Sugarcane
Fruit Crops	Grapes
Vegetable Crops	Brinjal
Floriculture	Rose

1.3 Advanced Methods of Agricultural Practices

- Role of organic farming in agriculture.
- Definition and types of biofertilizers and their applications. Viz. BGA, Rhizobium, Mycorrhiza.

Unit-2: General Methods of Plant Protection (15)

2.1 **Cultural Methods:** Tillage, sowing and planting dates, crop hygiene, crop rotation, trap crops, and fertilizers.

2.2 **Mechanical Methods:**

- Field sanitation, including the collection and destruction of diseased plant debris for diseases; hand-picking and destruction of egg masses
- shaking of plants, rope dragging, netting, bagging,
- physical barriers, use of sticky bands, tin-bands, and light traps.

2.3 **Physical Methods**: Heat treatment and Soil solarization

2.4 **Methods of Management of Insects pests and diseases.**

- Chemical Methods: Brief account and uses of bactericides, fungicides, insecticides, and nematicides.
- Biological Control: Introduction, biological control of insect pests and diseases.

Paper-DSC 2 - 4: Crop Diseases and their Management (30 Periods)

Unit-1: Crop Diseases (15 Periods)

1.1 Definition and Concept of Plant Disease:

1.2 Terminologies in Plant Pathology: Key terms include Host, Pathogenicity, Pathogenesis, Symptoms, Infection, Inoculation, Isolation, Incubation period, Etiology, Susceptibility, Immunity, Hypersensitivity, and Resistance.

1.3 Classification of Plant Diseases Based on

- Pathogens,
- Symptoms,
- Mode of Transmission of Pathogens: Through seed, soil, air, and insects

Unit-1.4 Methods of studying Plant Pathogens:

- Methods of Inoculation
- Incubation
- Koch's postulates

1.5 Mechanism of Plant Infection:

- Mode of infection (infestation), host-pathogen interaction, disease development,
- factors affecting infection

Unit -2: Study of the following crop diseases and their management. (15 Periods)

2.1 Diseases Caused by Phytoplasma:

- Little leaf of Brinjal

2.2 Diseases Caused by Viruses:

- Yellow vein mosaic of Okra (Bhendi)

2.3 Diseases Caused by Bacteria:

- Citrus canker

2.4 Diseases Caused by Fungi:

- Downy Mildew of Grapes,
- Rust of Soybean,
- Rust of Groundnut
- Grain Smut of Jowar

2.5 Assessment of Diseases in Crop Plants

- Qualitative Methods
- Quantitative Methods

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B.Sc. Part-II (Plant Protection)

Practical-III Based on DSC-2 -3 & 4

Semester III

1. Study of the gross morphology, crop identification, and agronomic conditions of the following crops:
   - Jowar
   - Wheat
2. Study of the gross morphology, crop identification, and agronomic conditions of the following crops:
   - Gram
   - Tur
3. Study of the gross morphology, crop identification, and agronomic conditions of the following crops:
   - Sunflower
   - Groundnut
4. Study of the gross morphology, crop identification, and agronomic conditions of the following crops:
   - Sugarcane
   - Grapevine
5. Study of the gross morphology, crop identification, and agronomic conditions of the following crops:
   - Brinjal
   - Okra
6. Study of the gross morphology, crop identification, and agronomic conditions of the following crops:
   - Mango
   - Pomegranate
7. Study of the gross morphology, crop identification, and agronomic conditions of the following crops:
   - Rose
   - Gerbera
8. Study of following diseases in crop plants with reference to host, causal organism, symptoms and management.
   - **Phytoplasma diseases:** Little leaf of Brinjal
9. Study of following diseases in crop plants with reference to host, causal organism, symptoms and management.
   - **Viral diseases:** Yellow vein mosaic of Okra (Bhindi)
10. Study of following diseases in crop plants with reference to host, causal organism, symptoms and management.
    - **Bacterial diseases:** Citrus canker
11. Study of following diseases in crop plants with reference to host, causal organism, symptoms and management.
    - **Fungal diseases**: Tikka disease of Groundnut,
12. Micrometry of fungal spores (any suitable material)
13. Submission
14. Field Diary

VSC -2 Practical – Based on DSC -2: 3 & 4

1. Preparation of culture media – NA, PDA
2. Isolation of pathogen from diseased plants (Koch's Postulates)
3. Inoculation, incubation, reproduction and symptoms of diseased plants.
4. Study of Pesticides with reference to chemical nature, characters, properties, mode of actions and uses. (at least two from each group) Group – Bactericides,
5. Study of Pesticides with reference to chemical nature, characters, properties, mode of actions and uses. (at least two from each group) Group – fungicides,
6. Study of Pesticides with reference to chemical nature, characters, properties, mode of actions and uses. (at least two from each group) Group – nematicides,
7. Study of Pesticides with reference to chemical nature, characters, properties, mode of actions and uses. (at least two from each group) Group – insecticides,
8. Study of Pesticides with reference to chemical nature, characters, properties, mode of actions and uses. (at least two from each group) Group – rodenticides,
9. Study of Pesticides with reference to chemical nature, characters, properties, mode of actions and uses. (at least two from each group) Group – herbicides,
10. Study of fungal diseases in crop plants with reference to host, causal organism, symptoms and management - Downy mildew of grapes
11. Study of fungal diseases in crop plants with reference to host, causal organism, symptoms and management - Rust of soyabean
12. Study of fungal diseases in crop plants with reference to host, causal organism, symptoms and management - Grain smut of jowar
13. Submission
14. Field Diary

SEMESTER-IV

PAPER – DSC 2-5: Introduction to Weeds and Non-Insect Pests (30 Lectures)

Unit-1: Weeds (15 Lectures)

1.1: Definition and losses caused by weeds

1.2: Classification of weeds based on

- Ontogeny
- Ecology
- Crop association

1.3: Study of special weeds

- Parasitic weeds
- Aquatic weeds
- Poisonous weeds

1.4 Study of the following weeds with reference to:

a. Gross morphology,
b. Reproduction,
c. Ecology,
d. Dispersal,
e. Management of weeds
    - *Parthenium hysterophorus*
    - *Amaranthus spinosus*
    - *Argemone mexicana*
    - *Cyperus rotundus*
    - *Euphorbia hirta*
    - *Cynodon dactylon*

Unit-2: Non-Insect Pests (15 Lectures)

Unit-2.1: Methods of Weed Management

- **Cultural methods:** Ploughing, Hoeing, Hand Weeding, Field Sanitation, Crop rotation, Mulching.
- **Biological methods:** Weed management by bacteria, fungi, and insects
- **Chemical methods**: Study of weedicides with reference to properties, mode of action, formulation, and use of
    - 2,4-D
    - Mira-71

2.2 **Study of Non-Insect Pests** (15 Lectures)

- Nematodes: Phytopathogenic nematodes, mode of infestation, symptoms caused by Meloidogyne, and management
- Snails and slugs (1 period): Nature of damage and their management
- Mites: Morphology, damage in storage and field, and their management
- Birds: Nature of damage/losses and management
- Rats: Damage/losses caused by rats in storage and field, and their management

PAPER – DSC- 2-6 Insect Pests and Their Management (30 periods)

Unit 1 Introduction to Insect Pests (15 periods)

1.1 Definition and loss: Qualitative and quantitative losses caused by insect pests .

1.2 General characteristics: Overview of typical insect features such as:

- Mouth parts
- Wing venation and coupling apparatus
- Types of legs
- Abdomen structure, segmentation, and appendages

1.3 Classification of insect pests based on

- nature of damage,
- mouth parts,
- metamorphosis

1.4 Study of following Insect pests of different crops with reference to

a. Scientific name
b. Identification marks
c. Host range
d. Life cycle
e. Nature of damage and management

Crop	Pest
Jowar	Stem borer
Sugarcane	Wooly aphids
Groundnut	White grubs
Gram	Pod borer
Mango	Jassids
Brinjal	Fruit borer
Tomato	Red Spider
Rose	Thrips

Unit 2 Pest Management (15 periods)

2.1 Stored grain pests and their Management

- Rice Weevil and
- Pulse Beetle

2.2 Management of insect pests

- Principles of insect pest control: Causes of insects assuming pest status (1 period).

2.3 Classification of insecticides:

a. Mode of entry: Stomach contact
b. Mode of action: Effects on respiratory and nervous systems
c. Chemical nature:
   - Inorganic
   - Organic: Chlorinated hydrocarbons,
   - plant-origin insecticides
d. Nature of formulation: Emulsifiable concentrates, dust, granules, wettable powders (8 periods).

2.4 Recent trends in pest management:

- Attractants
- Repellents
- Antifeedants
- Pheromones
- Chemosterilants
- Microbial insecticides.

Practical DSC 2 – Based on 5, 6

1. Study of the following weeds with reference to gross morphology, identification, reproduction, dispersal and management - Dicot weeds -
   i. ***Argemone mexicana***
   ii. ***Parthenium hysterophours***
   iii. ***Euphorbia hirta***
2. Study of the following weeds with reference to gross morphology, identification, reproduction, dispersal and management - Monocot Weeds
   i. ***Cyperus rotundus***
   ii. ***Amaranthus spinosus***
   iii. ***Cynodon dactylon***
3. Study of weeds reference to reproduction and ecology - Estimation of seeds by seed count method.
   i. ***Argemone mexicana***
   ii. ***Celosia argentia***
   iii. ***Portulaca oleracea*** or any locally available weed
4. Study of mode of dispersal in following weeds:
   i. ***Parthenium hysterophorus***
   ii. ***Tridax procumbens***
   iii. ***Vernonia cinerifolia***
5. Study of mode of dispersal in following weeds:
   i. ***Xanthium strumarium***
   ii. ***Alternanathera tenatea***
6. Study of mode of dispersal in following weeds:
   i. ***Achyranthus aspera***
   ii. ***Cynodon dactylon***
7. Study of following Insect pests of different crops with reference to Scientific name, Identification marks, Host range, Life cycle, Nature of damage and management

Crop infested	Nature of the Pest
Jowar	Stem borer
Sugarcane	Wooly aphids

8. Study of following Insect pests of different crops with reference to Scientific name, Identification marks, Host range, Life cycle, Nature of damage and management

Crop infested	Nature of the Pest
Groundnut	White grubs

Gram	Pod borer

9. Study of following Insect pests of different crops with reference to Scientific name, Identification marks, Host range, Life cycle, Nature of damage and management

Crop infested	Nature of the Pest
Mango	Jassids
Brinjal	Fruit borer

10. Study of following Insect pests of different crops with reference to Scientific name, Identification marks, Host range, Life cycle, Nature of damage and management.

Crop infested	Nature of the Pest
Tomato	Red Spider
Rose	Thrips

11. Study of stored grain pests with reference to Scientific name, Identification marks, Host range, Life cycle, Nature of damage and management. - Rice Weevil and Pulse Beetle

12. Study of root knot nematode of vegetable with reference to Scientific name, Identification marks, Host range, Life cycle, Nature of damage and management.

13. Submission

14. Field visit

Practical VSC - 4 Practical based on 5 & 6

1. Action of herbicide (2,4-D or Glyphosate) on the germination of seeds like *Amaranthus spinosus* or Portulaca oleracea or *Argemone mexicana*
2. Techniques of collection and preservation of insect pests:
    a. Wet preservation,
    b. Dry preservation,
3. Technique of collection and disposition of weeds
4. Separation of amino acids from healthy and diseased plants using ascending paper chromatography
5. Determination of sucrose percentage in healthy and infected fruits by hand refractometer.
6. Determination of pH of two soil samples
7. Preparation of pesticides.
8. Application of pesticides.
9. Calibration of the sprayer
10. Study of pesticide application equipment - Duster -Hand rotary duster, Sprayer -Knap-sac Sprayer
11. Study of following Insect pests with reference to scientific name, host range; life cycle, marks of Identification, nature of damage and management.

    Brinjal Fruit borer

12. Study of following Insect pests with reference to scientific name, host range; life cycle, marks of Identification, nature of damage and management.

    Tomato Leaf miner

13. Study of following Insect pests with reference to scientific name, host range; life cycle, marks of Identification, nature of damage and management.

    Rose Thrips

14. Field Report

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Practical in Plant Protection at B.Sc. Part-II (Semester Course)

(To be implemented from June-2025)

Practical Examination - Instructions

- Each candidate must produce a certificate from the Head of the Department stating that they have completed the practical course in a satisfactory manner as recommended by the Board of Studies and that the Laboratory Journal has been properly maintained.
- Every candidate must record their observations in the laboratory journal and write a report on each exercise performed. Journals must be checked and signed periodically by the teacher in charge and certified by the Head of the Department at the end of the respective semester.
- Candidates must produce their journals at the time of the practical examination, without which they will not be allowed to appear.

Excursions

- Frequent visits to local areas are required to study crop plants, weeds, insect pests, crop diseases, and non-insect pests. A report must be submitted.
- One excursion shall be to a research institute or agricultural center actively engaged in plant protection studies, lasting no more than five days.
- There shall be one teacher in charge for every 16 students, along with one additional lady teacher, one field collector, and one peon. Travel Allowance (T.A.) and Daily Allowance (D.A.) will be paid to the staff per university rules.

Submission

- Each candidate must maintain a submission record as per the prescribed format, certified by the in-charge teacher and Head of the Department.
- At the time of the practical examination, candidates must submit the following:
- Certified Laboratory Journal
- Certified Tour Report
- Certified Field Diary/Field Notebook
- Preserved or dry specimens of diseased plants (at least ten)
- Preserved insect pests (at least three)
- Herbaria of weeds (at least ten)

Submission work will be orally examined during the practical exam.

Distribution of Marks
SEMESTER III

Practical–III: (DSC-2-3 & 4) **Marks-30**

1)	Study of diseases of crops	06
2)	Preparation of Culture/medium/inoculation/isolation	04
3)	Micrometry	04
4)	Identification of Crops (Agronomy) and pesticides	06
5)	Field diary/field notebook	05
6)	Journal	05
		30

CA Practical Examination **20**

Total **50**

SEMESTER - IV

Practical–IV: (DSC-2-3 & 4) Marks-30

1)	Identification of weeds	03
2)	Identification of insect pest	03
3)	Chromatography	03
4)	Soil pH/Sucrose percentage	02
5)	Calibration	02
6)	Mode of reproduction and dispersal of weeds	02
7)	Insect preservation Techniques	02
8)	Herbicidal action on weed seed germination	02
9)	Use of sprayer/duster	02
10)	Preparation of pesticides / calibration of sprayer	02
11)	Submission	03
12)	Tour Report	04
		30

CA Practical Examination **20**

Total **50**

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B.Sc. Part-II- practical Examination in Plant Protection

(NEP-2020) March/April 2026

Semester III

Practical-III Based on DSC-2 -3 & 4

Date: Centre:

Time: 10:00 AM onwards Batch- Marks: 30

Note: Draw neat, labeled sketches wherever necessary.

Q. 1		Identify and describe symptoms: Identify and describe the symptoms of the diseased specimen ‘A’ and ‘B’. Leave your preparation for inspection.	8
Q. 2		Measure the dimension of the given fungal spore from specimen ‘C’ using micrometry technique.	3
Q.3		Identifications	9
	D	Identify the crop and describe the agronomical conditions of specimen ‘D’	
	E	Identify and describe the symptoms of specimen ‘E’	
	F	Comment upon the properties and uses of ‘F’	
Q. 4	a	Journal	5
	b	Submission	5

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B.Sc. Part-II- practical Examination in Plant Protection

(NEP-2020) March/April 2026

Semester III

VSC-2 - Practical-III Based on DSC-2 -3 & 4

Batch-

Date: Centre:

Time: 10:00 AM onwards Marks: 30

Note: Draw neat, labeled sketches wherever necessary

Q 1. a. Prepare the culture medium (PDA/NA)	3
b. Isolate and inoculate the pathogen from specimen 'A	3
Q 2. Identify and describe symptoms of diseased plant specimen B and C	5
Q 3. Identification	9
D- Identify and Describe the given diseased plant specimen	
E- Use and Mode action (Fungicides/ Bactericides)	
F- Comments up on- Insecticides	
Q 4. a Certified Journal	5
b Field Diary	5

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B.Sc. Part-II- practical Examination in Plant Protection

(NEP-2020) March/April 2026

Semester IV

Practical-III Based on DSC-2 -5 & 6

Batch-

Date: Centre:

Time: 10:00 AM onwards Marks: 30

Note: Draw neat, labeled sketches wherever necessary

Q.1. - Identify and describe the taxonomy, gross morphology, reproduction, dispersal and management 6

Of specimen 'A and B

Q 2. Sketch, label and comments on damaging stage in life cycle of specimen C and D 5

Q 3. Identification 9

E – Give the mark of identification of specimen (Any Pest)

F- Mode, reproduction and dispersal of specimen.

G – Identify and comment on specimen (any pest).

Q 4. a Certified Journal 5

b Submission 5

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B.Sc. Part-II- practical Examination in Plant Protection

(NEP-2020) March/April 2026

Semester IV

VSC-4 - Practical-III Based on DSC-2 -5 & 6

Batch-

Date: Centre:

Time: 10:00 AM onwards Marks: 30

Note: Draw neat, labeled sketches wherever necessary

Q.1. Find out the amino acid from healthy and diseased plant extract by using Ascending chromatography (Show result to Examiner) 5

Q 2. Find out the Sucrose percentage in the samples-F1-F2 by Hand Refractometer 3

Q. 3 Find out the pH of the given soil samples. 3

Q 3. Identification 9

a- Comments on Pesticides (Any)

b- Identify and describe the given insect pest specimen

c- Comments up on- Working Instruments

Q 4. a Certified Journal 5

b Field Diary 5

References

Paper – V- Major Crops and Methods of Integrated Plant Protection
Paper- VI – Crop Diseases and their management

Sr. No.	Name of the Book	Author (s)
1	Agronomy	V. J. Vaidya et. al.
2	Biofertilizers in Agriculture	Subba Rao
3	Commercial Vegetable Growing	Tindall
4	Crop Production and Field Experimentation	Vaidya, Sahastrabuddhe and Khupse
5	Cropping System and Theory	Chatterjee
6	Floriculture	Waurie and Ries
7	Handbook of Agriculture	IARI, New Delhi
8	High Yielding Varieties of Crops	Mahabal Rani
9	Identification of Crop Varieties	Agarwal
10	Irrigation	Michael
11	Plant Pathology	R. S. Malhotra
12	Plant Protection	Mukundan
13	Principles and Procedures of Plant Protection	Chattopadhyay
14	Roses	Tony Gregory
15	Scientific Crop Production	Mathur
16	Sugarcane	C. N. Babu
17	Sugarcane Cultivation	M. G. Jadhav
18	The Culture of Vegetables and Flowers from Seeds and Roots	Martin Sutton
19	Vegetable growing in India	P. S. Arya Prakash
20	Chemistry of insecticides and Fungicide	D. S. Sreeramalu
21	Disease of Crops Plants in India	Rangaswami
22	Fungi and Diseases in Plants	Butler
23	Fungicides in Disease Control	Y. L. Nene
24	Introduction to Plant Viruses	C. L. Mandahar
25	Plant Diseases and Epidemiology	Narayanan
26	Plant Diseases	Singh
27	Plant Diseases	Mathur
28	Plant Diseases	Gopa S. Dasgupta
29	Plant Pathogens	Singh R. S.
30	Plant Pathologist Pocket Book	EMI
31	Plant Pathology	P. D. Sharma
32	Plant Pathology	Walker
33	Post Harvest Technology of Cereals, Pulses and Oilseeds	Chakravarty
34	Viruses and Mycoplasma Diseases of Plants	Ray Chaudhari

References-

Paper VII: Introduction to Weeds and Non-insect Pests

Paper-VIII: Insect Pests and their Management

Sr. No.	Name of the Book	Author (s)
1	Agriculture Pests of India and Southeast Asia	Atwal
2	An Introduction to Entomology	P. D. Srivastava
3	Entomology	Pramod Kumar
4	General Entomology	M. S. Mari
5	Insect Pests of Crops	Pradhan and Jotwam
6	Introduction of Pest Management	Dhaliwal and Arora
7	Introduction of Insect Pest Management	Metcalf
8	Modern Entomology	Tembhare
9	Nematode Diseases of Agricultural Crops	Abstract of 8th All Union Conference
10	Pest Control	Van Emden
11	Plant Protection (Principles and Practice)	Mukundan J. R.
12	Principles of Weed Science	Rao V. S.
13	Scientific Weed Management	Gupta O. P.
14	Weed Control and as science	Klingmom
15	Weed Science	Thakur
16	Weeds of the World	King
17	World Guide to Insects Vol. I & II	Packard A. S.

Other Reference Books: -

Sr. No.	Name of Book	Author
1	Plant Disease Epidemiology	Nagarajan
2	Experimental and Conceptual Plant Pathology	Singh et.al.
3	Weed Weedicides and Weed control Principle and Practice	R. C. Mandal
4	Soil and Soil Management	Gustafson
5	Concepts in Integrated Pest Management	Nori is et. al.
6	Seed Science and Technology Lab manual	Mc Donald & Copeland
7	Seed Technology	Agrawal
8	Vegetable Crops Vol. I & II ed	Bose et. al.
9	Handbook of Horticulture	ICAR, K. L. Chadha
10	Commercial Flowers – Vol. I, II	Bose et. al.
11	Fruits – Tropical & Subtropical – Vol. I	Bose et. al.
12	Irrigation	Micheal
13	Plant Protection and Pest Management	Dr. Shubhrata R. Mishra
14	Application of Pesticides to crops	Graham A. Mathews
15	Stored Grain pests & Pest Management	B. P. Khare
16	Weed Science – Principles	R – Jaya Kumar
17	Plant – diseases	Rajni Sharma
18	A Textbook of Entomology	B. D. Patnaik
19	Principles of Insect Pest Management	G. S. Dhaliwal & Ramesh Arora
20	Plant Pathology	B. P. Pandey