

Estd. 1962

With CGPA 3.52

++" Accredited by NAAC (2021)

#### SHIVAJI UNIVERSITY, KOLHAPUR - 416004, MAHARASHTRA

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# शिवाजी विद्यापीठ, कोल्हापूर -४१६००४,महाराष्ट्र

दूरध्वनी-ईपीएबीएक्स -२६०९०००, अभ्यासमंडळे विभाग दुरध्वनी ०२३१—२६०९०९४ ०२३१—२६०९४८७



#### SU/BOS/Science/350

To,

The Principal, All Concerned Affiliated Colleges/Institutions Shivaji University, Kolhapur

**Subject:** Regarding Minor Change syllabi of B.Sc. Part-I (Sem.I & II) as per NEP-2020 (2.0) degree programme under the Faculty of Science and Technology.

Ref: SU/BOS/Science/876/ Date: 26/12/2023 Letter.

#### Sir/Madam,

With reference to the subject mentioned above, I am directed to inform you that the university authorities have accepted and granted approval to the Minor Change syllabi, nature of question paper of B.Sc. Part-I (Sem.I & II) as per NEP-2020 (2.0) degree programme under the Faculty of Science and Technology.

	B.Sc.Part-I (Sem. I & II ) as per NEP-2020 (2.0)					
1.	Botany	9.	Geology			
2.	Physics	10.	Zoology			
3.	Statistics	11.	Chemistry			
4.	Astrophysics	12.	Geography			
5.	Mathematics	13.	Electronics			
6.	Microbiology	14.	Drug Chemistry			
7.	Plant Protection	15.	Industrial Microbiology			
8.	Astrophysics and Space Science	16.	Sugar Technology (Entire)			

This syllabus, nature of question and equivalence shall be implemented from the academic year 2024-2025 onwards. A soft copy containing the syllabus is attached herewith and it is also available on university website <u>www.unishivaji.ac.in NEP-2020@suk(Online Syllabus)</u>

The question papers on the pre-revised syllabi of above-mentioned course will be set for the examinations to be held in October /November 2024 & March/April 2025. These chances are available for repeater students, if any.

You are, therefore, requested to bring this to the notice of all students and teachers concerned.

Thanking you,

Registrar S. M. Kubal

#### Copy to:

1	The Dean, Faculty of Science & Technology	4	B.Sc. Exam/ Appointment Section
2	Director, Board of Examinations and Evaluation	5	Computer Centre/ Eligibility Section
3	The Chairman, Respective Board of Studies	6	Affiliation Section (U.G.) (P.G.)

Date: 24/06/2024

# SHIVAJI UNIVERSITY, KOLHAPUR.



Accredited By NAAC with 'A++'Grade

**Revised Syllabus For** 

**B. Sc. Plant Protection (DSC)** 

(Faculty of Science & Technology)

Paper –I, II-(Semester-I)

and

Paper-III, IV-(Semester-II)

NEP-2020 (2.0) Syllabus to be implemented from June, 2024 onwards

SHIVAJIUNIVERSITY,KOLHAPUR NEP-2020 (2.0): Credit Framework for UG(B. Sc.) Programme under the Faculty of Science and Technology									
SEM (Level)		COURSES		OE	VSC/ SEC	AEC/VEC/IKS	OJT/FP/ CEP /CC/RP	Fotal Credits	Degree/ Cum. Cr. MEME
	Course -1	Course-2	Course-3						
SEMI (4.5)	DSC-I(2) DSC-II (2) DSC P-I(2)	DSC-I(2) DSC-II (2) DSC P-I(2)	DSC-I(2) DSC-II (2) DSC P-I(2)	OE-1(2) (T/P)		IKS-I(2)		22	UG Certificate
SEMII (4.5)	DSC-III(2) DSC-IV (2) DSC P- II(2)	DSC-III(2) DSC-IV (2) DSC P-II(2)	DSC-III(2) DSC-IV (2) DSC P-II(2)	OE-2(2) (T/P)		VEC-I(2) (Democracy, Election and Constitution)		22	44
Credits	8(T)+4(P)=12	8(T)+4(P)=12	8(T)+4(P)=12	2+2=4 (T/P)		2+2=4		44	Exit Option:4 credits NSQF /Internship/ Skill courses

#### SEMESTER I

# PLANT PROTECTION PAPER (DSC – I): INTRODUCTION TO PLANT PROTECTION AND STUDY OF MAJOR CROPS

# **CREDIT: 2. LECTURE HOURS: 2 PER WEEK; MARKS: 50**

MODULE	SUB-	TOPIC	LECTURE			
	MODULE		PERIOD			
1	INTROL	DUCTION TO PLANT PROTECTION	15			
1	1.	1.1 Introduction and importance of plant protection.	15			
	Introduction	1.2 Introduction to agronomic crops: Study of				
	to plant	following crops with reference to gross morphology,				
	protection	soil type, climatic conditions, planting materials and				
	and Major	and Major methods, irrigation, fertigation, yield, varieties				
	crops	a. Cereal crop: Jowar				
		b. Pulse crop: Chick pea				
		c. Sugar crop: Sugarcane				
		d. Oil crop: Groundnut				
		e. Fruit crop: Mango				
		f. Vegetable crop: Brinjal				
		g. Spice crop: Chili				
		h. Flower crop: Rose				
2	МЕТНО	DS OF PLANT PROTECTION	15			
	2.1 Methods of General methods of plant protection:					
	plant	i) Cultural methods: Tillage, Crop rotation,				
	protection	Trap crops, Fertilizer applications.				
		ii) Mechanical methods: Field sanitation, Hand				
		picking, Destruction of egg masses, Light traps,				
		Sticky bags, Bagging for the insects.				
		iii) Physical methods: Heat and Soil solarization				
	2.2 Advances	i) Organic farming: Principles and its scope	7			
	in	ii) Green manuring: Introduction, Advantages and				
	agricultural	Types-				
	practices	a. Leguminous green manures: e.g., Crotalaria juncea				
		b. Cover crops: e.g., Brassica juncea.				
		iii) Biofertilizers: Introduction, Advantages and Types-				
		a. Bacterial biofertilizers, e.g., Rhizobium,				
		b. Fungal biofertilizers: e.g., VAM				

c. Algal biofertilizers:	e.g., Nostoc.	
iv) Organic fertilizers: V	Vermicompost and Vermiwash	
(Introduction, Advantag	ges.)	
v) Biopesticides: Introduc	ction, Advantages and Types-	
a. Microbial pesticides	5	
b. Biochemical pesticio	des: Botanicals	
c. Plant incorporated p	protectants (PIPS) e.g., cry gene	
from Bacillus thuring	iensis.	
TOTAL LECTUR	ES 30	

#### SEMESTER I

# PLANT PROTECTION PAPER – DSC-II: PLANT PATHOLOGY CREDIT: 2. LECTURE HOURS: 2 PER WEEK; MARKS: 50

U <b>nit</b>	Subunit	TOPIC	PERIODS	
			LECTURES	
1	INTRO	INTRODUCTION TO PLANT DISEASES		
	1.1 Concept of	i) Definition and concept of plant disease,	07	
	Plant Disease	Terminologies in Plant Pathology: Host,		
		Pathogen, Pathogenicity, Pathogenesis, Symptoms,		
		Infection, Incubation Period, Etiology,		
		Susceptibility, Immunity, Hypersensitivity,		
		Resistance.		
		ii) Classification of plant diseases – Based on		
		a. <b>Cause of the disease:</b> e.g., non-infectious		
		disease and infectious disease		
		b. Causal organism: e.g., Nematodal diseases,		
		Viral diseases, Mycoplasmal diseases, Bacterial		
		diseases, Fungal diseases, Algal diseases,		
		Parasitic flowering plants.		
		c. Symptoms: e.g., Rust, Smut, Canker, Mosaic,		
		Anthracnose, Wilting, Die-back, Damping off,		
		Blight and Mildew.		
		d. Mode of spread of pathogen: e.g., Soil borne,		
		Seed borne, Air borne and vector borne		
		diseases.		
		iii) Mechanism of infection:		
		a) Penetration		
		b) Host pathogen interaction		
		c) Factors governing the process of infection.		
	1.2 Study of Plant	i) Study of following plant diseases with reference to	08	
	Diseases	symptoms, pathogen, disease cycle and their		
		management.		
		A. Infectious diseases		
		a) <b>Mycoplasmal disease:</b> Grassy shoot disease		
		of sugarcane		
		b) <b>Viral disease:</b> Little leaf of Brinjal		
		c) <b>Bacterial disease:</b> Citrus canker		
		d) <b>Fungal disease:</b> i. Rust of Soybean,		

		ii. White rust of Amaranthus, iii. Grain	
		smut of jowar, iv. Tikka disease of ground	
		nut	
		B. Non infectious disease: Introduction, Example	
		(with respect to symptoms, causal abiotic	
		factor, symptoms, remedy) e.g., Black heart of	
		potato	
2	PLANT DIS	EASE CONTROL	15
	2. Principles of	i) Introduction	8
	Plant Disease	ii) Disease control through Resistance-	
	control	a) Disease escape	
		b) Disease endurance or tolerance	
		c) Natural devices for resistance-	
		i) Protective: Structural modifications,	
		Production of toxic chemical substances,	
		Stimulant deficiency, Absence of antigen.	
		ii) Defensive: Histological modifications	
		(Formation of cork layers, Abscission layers,	
		Tyloses, Callus formation, Gum secretion).	
	2Management of	i)Disease control through cultural practices: e.g.,	7
	Plant Diseases	Crop rotation, Intercropping, Drying, Ageing and	
		cleaning of the seeds, Thermal treatment to seeds,	
		Shallow planting.	
		ii) Biological control	
		iii) Plant Quarantine Organization in India	
		iv) Chemical control- Fungicides: Study with	
		reference to properties, mode of action and uses of	
		-Bordeaux mixture and Carbendazim.	
	TOTAL LEC	CTURES	30

#### SEMESTER II

#### PLANT PROTECTION PAPER DSC-III: INTRODUCTION TO WEEDS AND WEED MANAGEMENT

#### **CREDIT: 2. LECTURE HOURS: 2 PER WEEK; MARKS: 50**

UNIT	SUB UNIT	TOPIC	PERIOD		
1	INTRODUCTION TO WEEDS				
	1.1 Introduction to i) Weeds – Definition and losses caused by weeds.Weedsii) Classification of weeds based on				
		a) Ontogeny b) Ecology c) Crop association			
		iii) Reproduction and mode of dispersal of weeds.			
		iv) Study of parasitic weeds-			
		a) Root parasite: Total root parasite ( <i>Orobanche</i> sp.),			
		Partial root parasite (Striga sp.)			
		<b>b)</b> Stem parasite: Total stem parasite ( <i>Cuscuta</i> sp.),			
		Partial stem parasite (Dendrophthoe sp.)			
	1.2 Study of Weeds	si) Study of following weeds with reference to			
		a) Gross morphology b) Reproduction c) Ecology			
		d) Dispersal and e) Management			
		A. Dicot Weeds			
		i. Parthenium hysterophorus			
		ii. Euphorbia hirta			
		iii. Alternanthera sessilis			
		B. Monocot Weeds			
		v. Cyperus rotundus			
		vi. Cynodon dactylon			
2	WEED MAN	AGEMENT	15		

2. Methods of	i) Mechanical methods - Ploughing, Hoeing, Hand	08
Weed	weeding, Sickling and mowing, Burning and	
Management	flooding, Mulching.	
	ii) Biological methods - Bioherbicides and their	
	application in agriculture.	
	iii) Chemical methods -Study of weedicides with	
	reference to properties, mode of action, formulation	
	and uses of -	
	i) 2, 4-D	
	ii) Gramoxone (Paraquat)	
2.2 Weed Biology	i) Weed physiology after application of herbicides	07
	ii) Absorption and translocation of herbicides with	
	reference to photosynthesis	
	iii) Concept of herbicide resistance	
TOTAL LEO	CTURES	30

#### SEMESTER II

### PLANT PROTECTION PAPER DSC- IV: INSECT PESTS, NON-INSECT PESTS AND THEIR MANAGEMENT

UNIT	SUBUNIT	ТОРІС	PERIOD
1	INTRODUCTION TO	D INSECT PESTS AND NON- INSECT	15
	PESTS		
	1.1 Introduction to Insect	i) Definition and losses (Qualitative and	8
	Pests and Non-Insect Pests	Quantitative) caused by insect pests	
		ii) General characters of insects.	
		iii) Introduction to common insect pests	
		a. Aphids	
		b. Caterpillars	
		c. Grasshoppers	
		d. Thrips	
		e. Weevils	
		iv) Definition and losses (qualitative and	
		quantitative) caused by non-insect pests	
		v) Introduction to common non insect	
		pests	
		a. Nematodes	
		b. Snails and Slugs	
		c. Rodents	
		d. Birds	
	1.2 Study of Insect Pests	i) Study of following insect pests of	7
		different crops with reference to –	
		Scientific name, Marks of	
		identification, Life cycle, Nature of	
		damage and Management	
		a. Sugarcane white grub	
		b. Jowar stem borer	
		c. Brinjal fruit borer	
		ii) Study of following stored grain pests of	
		different crops with reference to:	
		Scientific name, Marks of	
		identification, Life cycle, Nature of	

# CREDIT: 2. LECTURE HOURS: 2 PER WEEK; MARKS: 50UNITSUBUNITTOPICLECTURE

		damage and Management	
		a. Rice weevil	
		b. Pulse beetle	
2	MANAGEMENT OF	INSECT PESTS AND NON- INSECT	15
	PESTS		
	2.1 Management of Insect	i) Integrated Pest Management (IPM):	8
	pests and non-insect pests	Introduction, history, importance,	
		concepts, principles and tools of IPM.	
		ii) Insecticides	
		a. Introduction	
		b. Nature of formulation – Dusts,	
		Granules, Wettable powder,	
		Emulsifiable concentrates.	
		c. Classification of insecticides based on	
		i) Mode of entry – stomach, contact	
		and systemic	
		d. Insecticides - Common example with	
		respect to introduction, chemical nature,	
		properties, mode of entry, mode of action	
		and uses of- Malathion, Carbaryl,	
		Pyrethrin and Azadirachtin	
	2.2 Recent trends in Pest	i) Introduction, types and advantages of:	7
	Management	a. Attractants	
		b. Repellants	
		c. Antifeedants	
		d. Pheromones	
		e. Chemosterilants	
	TOTAL LECTURES		30

# Semester-I Practical-I Based on paper I and II (DSC P I) Total Marks 50

- 1. Study of green manures e.g., Crotalaria juncea and Brassica juncea.
- 2. Study of biofertilizers: Rhizobium, Nostoc and biopesticide: Azadirachta indica.
- 3 to 6. Study of following agronomic crops with reference to gross morphology, soil type, climatic conditions, planting materials and methods, irrigation, fertigation, yield and varieties
  - a. Cereal crop: Jowar
  - b. Pulses crop: Chick pea
  - c. Oil crop: Groundnut
  - d. Fruit crop: Mango
  - e. Vegetable crop: Brinjal
  - f. Spice crop: Chili
  - g. Flower crop: Rose
- 7 to 12. Study of following plant diseases with reference to host, symptoms, pathogen, disease cycle and their management
  - a)Mycoplasmal disease: Grassy shoot disease of sugarcane
  - b)Viral disease: Yellow vein mosaic of Bhendi
  - c)Bacterial disease: Guava fruit canker
  - d)Fungal disease: i. Rust of Soybean ii. White rust of Amaranthus,
    - iii. Grain smut of jowar iv. Tikka disease of ground nut
- 13. Submission of crop diseases (any five).

# Semester II Practical-II Based on paper III and IV (DSC-PII) Total 50 Marks

- 1. Study of following weeds with reference to a) Gross morphology b) Reproduction c) Ecology, d)
  - Dispersal and e) Management
  - A. Dicot Weeds
    - i. Parthenium hysterophorus
    - ii. Alternanthera sessilis
  - B. Monocot Weeds
    - i. Cyperus rotundus
    - ii. Cynodon dactylon
- 2. Study of following parasitic weeds with reference to a) Host b) Gross morphology
  - c) Reproduction d) Management : i) Orobanche, ii) Striga, iii) Cuscuta.
- 3. Study of common insect pests and non-insect pests with reference to morphology and nature of damage: i) Aphids ii) Caterpillars iii) Snails.
- 4. Study of following insect pests of different crops with reference to –Scientific name, Marks of identification, Life cycle, Nature of damage and Management:
  - i) Sugarcane white grub
  - ii) Brinjal fruit borer
- 5. Study of following stored grain pests of different crops with reference to –Scientific name, Marks of identification, Life cycle, Nature of damage and Management:
  - i) Rice weevil
  - ii) Pulse beetle
- 6. Study of Attractants (Light trap, sticky trap) and Repellants (Naphthalene ball, Vitex negundo).
- 7. Examples on preparation of pesticides for application.
- 8. Determination of sucrose percentage in Sugarcane by hand refractometer (any two varieties).
- 9. Isolation of soil fungi from soil sample by using serial dilution method.
- 10. Separation of amino acids from healthy and diseased plants using paper chromatography technique.
- 11. -Study of weedicides with reference to properties, mode of action, formulation and usesi) 2, 4-Dii) Gramoxone (Paraquat)
- 12. Field visit/ excursion/visit to agricultural institute/ Agro industry/polyhouses.
- 13) Submission of any five common / stored grain insect pests.

#### **Course Outcomes:**

Paper I:

After successful completion of the course, the students will be able to

- 1. Know the scope and importance of the agronomy in the field of agriculture.
- 2. Identify different varieties of the crops and their significant role
- 3. Know the cultural practices of the different crops.
- 4. Develop the skill to prepare different types of manures and biofertilizers.

#### Paper II:

After successful completion of the course, the students will be able to

- 1. Know the scope and importance of the agronomy in the field of agriculture.
- 2. Know the mode of dispersion of pathogen.
- 3. Identify different plant diseases and their management.
- 4. Acquaint the broadcasting of plant diseases.

#### Paper III:

After successful completion of the course, the students will be able to

- 1. Know the scope and importance of the plant pathology in the field of agriculture.
- 2. Identify different weeds and know the management practices.
- 3. Prepare the formulations of different herbicides, fungicides and pesticides.
- 4. Manage the plant diseases from the field.

#### Paper IV:

After successful completion of the course, the students will be able to

- 1. Know the scope and importance of entomology in the field of agriculture.
- 2. Identify different insect pests and their management.
- 3. Identify different non insect pests and their management.
- 4. Prepare the formulations of different pesticides.

Nature of theory question paper and scheme of marking:	Total 40 Marks/ Per paper
Q. 1. Multiple choices questions (8-questions).	8 Marks
Q. 2. Attempt any two of the following (out of three).	16 Marks
Q. 3. Write short notes any four of the following (out of six).	16 Marks

Follow the rules of Shivaji University Kolhapur regarding NEP-2020 syllabus and examination.