

Board of Studies of Department of Plant Pathology

Virtual meeting for Board of studies of Department of Plant Pathology, C.S.J.M. University, Kanpur was held on 13 May, 2021 at 4:00 PM to 5:00 PM to discuss the syllabus for Plant Pathology as per National Education Policy-2020 (NEP-2020) for the Courses of B. Sc. (Hons.) Agriculture.

Honorable Members of the Virtual meeting attended.

1. Prof. Nand Lal, University Representative, Department of Life Science, C.S.J.M.U., Kanpur
2. Prof. Ram Chandra, Department of Plant Pathology, IAS, B.H.U. Varanasi
3. Dr. Manoj Kumar Yadav, Department of Plant Pathology, Janta College, Bakewar, Etawah

The following suggestions/ Recommendations are offered by honorable members in the virtual meeting.

1. The Sequence of course according to the order of semester.
2. Honorable members suggested adding reading books for each papers of Plant Pathology.
3. All the members suggested that no change should be made in the syllabus.

Therefore, I am sending this file for approval after mentioning the valuable suggestions offered by all the above. Kindly approve it.



Dr. M.P. Yadav

Dean/ Convener

CSJM University Kanpur

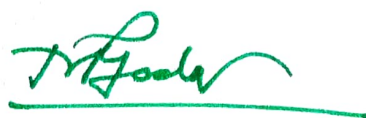
NEW SYLLABUS AS NEP 2020 (NEW AND RESTRUCTURED) UNDER GRADUATE CURRICULA & SYLLABUS B.Sc. (Hons.) Agriculture 2020

Semester System as per ICAR Vth Deans Committee Report

| Name | Designation | Affiliation |
|---|---|---|
| Steering Committee | | |
| Mrs. Monika S. Garg, (I.A.S.) Chairperson Steering Committee | Additional Chief Secretary | Dept. of Higher Education U.P., Lucknow |
| Prof. Poonam Tandan | Professor, Dept. of Physics | Lucknow University, U.P. |
| Prof. Hare Krishna | Professor, Dept. of Statistics | CCS University Meerut, U.P. |
| Dr. Dinesh C. Sharma | Associate Professor, Dept. of Zoology | K.M. Govt. Girls P.G. College Badalpur, G.B. Nagar, U.P. |
| Supervisory Committee-Science Faculty | | |
| Dr. Vijay Kumar Singh | Associate Professor, Dept. of Zoology | Agra College, Agra |
| Dr. Santosh Singh | Dean, Dept. of Agriculture | Mahatma Gandhi Kashi Vidhyapeeth, Varanasi |
| Dr. Babu Tabassum | Associate Professor, Dept. of Zoology | Govt. Raza P.G. College Ramapur, U.P. |
| Dr. Sanjay Jain | Associate Professor, Dept. of Statistics | St. John's College, Agra |

Syllabus Developed by:

| S.No. | Name | Designation | Department | College/University |
|-------|------------------------|------------------------|----------------------|---|
| 1. | Dr. Santosh Singh | Dean | Agriculture | Mahatma Gandhi Kashi Vidhyapeeth, Varanasi |
| 2. | Dr. Sant Bahadur Singh | Associate Professor | Agronomy | R.B.S. College, Agra |
| 3. | Dr. Laxman Singh | Associate Professor | A.H. and Dairying | R.B.S. College, Agra |



Department of Plant Pathology

| S.N. | Course Code | Course Title | Credit Hours |
|--------------|-------------|---|--------------|
| 1 | AG-206 | Fundamentals of Plant Pathology | 4(3+1) |
| 2 | AG-307 | Principles of Integrated Disease Management | 3(2+1) |
| 3 | AG-506 | Diseases of Field and Horticultural Crops & Their Management-I | 3(2+1) |
| 4 | AG-605 | Diseases of Field and Horticultural Crops & Their Management-II | 3(2+1) |
| Total Credit | | | 13 |

1. Fundamentals of Plant Pathology

4(3+1) AG-206

Theory

Introduction: Importance of plant diseases, scope and objective of Plant Pathology. History of Plant Pathology with special reference to Indian work. Terms and concept in Plant Pathology, Pathogenesis, diseases triangle and tetrahedron and classification of plant diseases, Important Plant pathogenic organism fungi, bacteria, fastidious vesicular bacteria, Phytoplasmas, Spiroplasmas, viruses, viroids, algae, protozoa, phanerogamic parasite and nematodes with example of diseases caused by them. Diseases due to a biotic causes.

Fungi: general character, definition of fungus, somatic structures, type of fungus thalli, fungal tissues, modifications of thallus, reproduction (Asexual and Sexual). Nomenclature, Binomial system of nomenclature, rules of nomenclature, classification of fungi, key to divisions, sub-divisions, orders and classes.

Bacteria and mollicutes: general morphological characters, basic methods reproduction.

Viruses: nature of properties, structure and transmission.

Study of phanerogamic plant parasites.

Epidemiology: Factors affecting disease development.

Practical

Acquaintance with various laboratory equipments and microscopy. Collection and preservation of disease specimen. Preparation of media, isolation and koch's postulates. General study of different structure of fungi, study of symptoms of various plant diseases. Study of representative fungal genera. Staining and identification of plant pathogenic bacteria. Study of phanerogamic plant parasites. Identification of plant parasitic nematodes.

Suggested Reading Books

- Agrios GN. 2005. Plant Pathology. 5th Ed. Academic Press, New York



- Mehrotra RS and Aggarwal A. 2003. Plant Pathology. 2nd Ed. Oxford & IBH, New Delhi
- Singh RS. 2002. Introduction to Principles of Plant Pathology. Oxford & IBH, New Delhi
- Singh DP & Singh A. 2007. Disease and Insect Resistance in Plant. Oxford & IBH, New Delhi
- Upadhyay RK & Mukherjee KG. 1997. Toxins in Plant Disease Development and evolving Biotechnology. Oxford & IBH, New Delhi
- Heitefuss R & Williams PH. 1976. Physiological Plant Pathology. Springer Verlag, Berlin, New York
- e-ICAR- B.Sc. (Ag). Icar.org.in
- Alexopoulos CJ, Mims CW & Blackwell M. 2000. *Introductory Mycology*. 4th Ed. John Wiley & Sons, New York.
- Jayaraman J & Verma JP. 2002. Fundamentals of Plant Bacteriology. Kalyani Publ., Ludhiana.
- Hull R. 2002. Mathew's Plant Virology. 4th Ed. Academic Press, New York.
- Upadhyay KD and Dwivedi, Kushum. 2003. Introductory Plant Nematology. Kalyani publication. New Delhi

2. Principles of Integrated Disease Management

3(2+1) AG-307

Theory

Categories of diseases, IDM: Introduction, history, importance, concepts, principles and tools of IDM. Economic importance of diseases and Methods of detection and diagnosis of diseases. Calculation and dynamics of economic injury level and importance of Economic threshold level. Methods of control: Host plant resistance, cultural, mechanical, physical, legislative, biological and chemical control. Survey surveillance and forecasting of diseases. Safety issues in fungicide uses. Political, social and legal implication of IDM.

Practical

Methods of diagnosis and detection of plant diseases, Methods of plant disease measurement, Assessment of crop yield losses, calculations based on economics of IDM, Identification of biocontrol agents, different predators and natural enemies. Identification and nature of damage of important diseases and their management. Plan & assess preventive strategies (IDM module) and decision making, crop monitoring attacked by diseases. Farmers fields visit.

Suggested Reading Books

- Agrios GN. 2005. Plant Pathology. 5th Ed. Academic Press, New York
- Mehrotra RS and Aggarwal A. 2003. Plant Pathology. 2nd Ed. Oxford & IBH, New Delhi

- Singh RS. 2002. Introduction to Principles of Plant Pathology. Oxford & IBH, New Delhi
- Singh RS. 2008. Plant Disease Management. Oxford & IBH, New Delhi
- Fry WE. 1982. Principles of Plant Pathology. Academic Press, New York
- Palti J. 1981 Cultural Practices and Infectious Crop Diseases. Springer Verlag, New York
- Nene YL & Thapliyal PN. 1993. Fungicides in Plant Disease Control .Oxford & IBH, New Delhi
- e-ICAR- B.Sc. (Ag). Icar.org.in
- Hewitt HG. 1998. *Fungicides in Crop Protection*. CABI, Wallington.
- Marsh RW. 1972. *Systemic Fungicides*. Longman, New York.
- Vyas SC. 1993 *Handbook of Systemic Fungicides*. Vols. I-III. Tata McGraw Hill, New Delhi.

3. Diseases of Field and Horticultural Crops & Their Management–I 3(2+1) AG-506

Theory

Symptoms, etiology, disease cycle and management of major diseases of following crops:

Field Crops: Rice: Blast, Brown spot, Bacterial Blight, Sheath blight, false smut, Khaira and tungro; Maize: stalkrots, downy mildew; Sorghum: smuts; Bajra: downy mildew and ergot; Groundnut: early and leaf spots; Pigeonpea: Phytophthora blight, wilt and sterility mosaic; Green gram: Cercospora leaf spot, web blight and yellow mosaic; Tobacco: Mosaic. **Horticultural Crops:** Guava: wilt and anthracnose; Banana: Panama wilt, sigatoka and bunchy top; Papaya: foot rot and leaf curl.

Cruciferous vegetable: Alternaria leaf spot and black rot; Brinjal: phomopsis blight, sclerotinia and little leaf; Tomato: early and late blight, leaf curl and mosaic; Okra: Yellow Vein Mosaic; Beans: Anthracnose and bacterial blight; ginger: soft rot; Colocasia: Phytophthora blight.

Practical

Identification and histopathological studies of selected diseases of field and horticultural crops covered in theory. Field visit for the diagnosis of field problems. Collection and preservation of plant diseased specimens for herbarium.

Note: Students should submit 10 pressed and well- mounted specimens.

Suggested Reading Books

- Singh RS. 2007. Plant Disease. 8th Ed. Oxford & IBH, New Delhi
- Mehrotra RS and Aggarwal A. 2003. Plant Pathology. 2nd Ed. Oxford & IBH, New Delhi

- Rangaswami G. 1999. Diseases of Crop Plants in India. 4th Ed. Prentice Hall of India, New Delhi
- Agrios GN. 2005. Plant Pathology. 5th Ed. Academic Press, New York
- Thind, TS. 1998. Diseases of field Crops and Their Management. National Agril. Tech. Information Centre, Ludhiana, India
- Singh US, Mukhopadhyay AN, Kumar J & Chaube H.S. 1992. Plant Diseases of International Importance Vol. I, Diseases of Cereals and Pulses. Prentice Hall. Englewood Cliffs, New Jersey
- e-ICAR- B.Sc. (Ag). Icar.org.in
- Joshi LM, Singh DV & Srivastava KD. 1984. *Problems and Progress of Wheat Pathology in South Asia*. Malhotra Publ. House, New Delhi.
- Ricanel C, Egan BT, Gillaspie Jr AG & Hughes CG. 1989. *Diseases of Sugarcane, Major Diseases*. Academic Press, New York.
- Gupta VK & Sharma SK. 2000. *Diseases of Fruit Crops*. Kalyani Publ., New Delhi.
- Pathak VN. 1980. *Diseases of Fruit Crops*. Oxford & IBH, New Delhi.
- Singh RS. 2000. *Diseases of Fruit Crops*. Oxford & IBH, New Delhi.
- Walker JC. 2004. *Diseases of Vegetable Crops*. TTPP, India.

4. Diseases of Field and Horticultural Crops & Their Management–II 3(2+1) AG-605

Theory

Symptoms, etiology, disease cycle and management of major diseases of following crops:

Field Crops:

Wheat: Rusts, loose smut, karnal bunt, powdery mildew, Alternaria blight and ear cockle;

Sugarcane: red rot, smut, wilt and grassy shoot

Sunflower: Sclerotinia stem rot and Alternaria blight;

Mustard: Alternaria blight, white rust, downy mildew; Gram: wilt and Ascochy tab light; Lentil:

Rust and wilt; Cotton: Vascular wilt and black arm; Pea: Downy mildew, powdery mildew and rust.

Horticultural Crops: Mango: Anthracnose, malformation, powdery mildew; Citrus: canker and gummosis; Grape vine: Downy mildew powdery mildew; Apple: scab and Fire blight; Peach: leaf curl;

Cucurbits: downy mildew, powdery mildew and wilt; Onion and garlic: purple blotch and stemphylium blight; Chilli: anthracnose and leaf curl; Turmeric: leaf spot; Coriander: stem gall; Marigold: Botrytis blight; Rose: dieback, powdery mildew; Potato: Early and late blight, Common scab, powdery scab, black scurf and potato mosaic.

Practical

Identification and histopathological studies of selected diseases of field and horticultural crops covered in theory. Field visit for the diagnosis of field problems. Collection and

preservation of plant diseased specimens for herbarium.

Note: Students should submit 10 pressed and well- mounted specimens.

Suggested Reading Books

- Singh RS. 2007. Plant Disease. 8th Ed. Oxford & IBH, New Delhi
- Mehrotra RS and Aggarwal A. 2003. Plant Pathology. 2nd Ed. Oxford & IBH, New Delhi
- Rangaswami G. 1999. Diseases of Crop Plants in India. 4th Ed. Prentice Hall of India, New Delhi
- Agrios GN. 2005. Plant Pathology. 5th Ed. Academic Press, New York
- Thind, TS. 1998. Diseases of field Crops and Their Management. National Agril. Tech. Information Centre, Ludhiana, India
- Singh US, Mukhopadhyay AN, Kumar J & Chaube H.S. 1992. Plant Diseases of International Importance Vol. I, Diseases of Cereals and Pulses. Prentice Hall. Englewood Cliffs, New Jersey
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- Joshi LM, Singh DV & Srivastava KD. 1984. *Problems and Progress of Wheat Pathology in South Asia*. Malhotra Publ. House, New Delhi.
- Ricanel C, Egan BT, Gillaspie Jr AG & Hughes CG. 1989. *Diseases of Sugarcane, Major Diseases*. Academic Press, New York.
- Gupta VK & Sharma SK. 2000. *Diseases of Fruit Crops*. Kalyani Publ., New Delhi.
- Pathak VN. 1980. *Diseases of Fruit Crops*. Oxford & IBH, New Delhi.
- Singh RS. 2000. *Diseases of Fruit Crops*. Oxford & IBH, New Delhi.
- Walker JC. 2004. *Diseases of Vegetable Crops*. TTPP, India.

