Scheme for M.Sc. SEED TECHNOLOGY NEP 2020

For One Year PG programme

Scheme C-2: (For the course of science having major practicum components)

M.Sc. Seed Technology II Semester

S.No.	Course Code	Course Name	Total Marks	Credit (s)	End Semester Exam Marks		Internal Marks	
					Max.	Min.	Max.	Min.
1.	CC-21	Plant Breading, Seed Pathology and Entomology	100	6	60	24	40	16
2.	CC-22	Seed Marketing Management and Agriculture Statistics With Computer Application	100	6	60	24	40	16
3.	PC-21	Practical - I	100	4	60	24	40	16
4.	PC-22	Practical – II	100	4	60	24	40	16
		Grand Total		**20**				

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RAJA SHANKAR SHAH UNIVERSITY, CHHINDWARA (M.P.)
DEPARTMENT OF SEED TECHNOLOGY
Syllabus Session: 2025-26
M.Sc. Seed Technology (1 Year Programme)
Semester -II
Paper- I

Part A: Introduction			
Program:	Class: M.Sc.	Semester : II	Session 2025-26
Subject : M.Sc. Seed Technology			
Course Code	**CC-11**		
Course Title	**Plant Breading, Seed Pathology and Entomology**		
Course Type	Core Course		
Pre-requisite (If any)	Graduation for any one B.Sc. Seed Technology		
Course Learning Outcomes	➢ Germplasm and Gene Banks: You'll understand the importance of gene banks and how they work, including conservation and utilization of genetic resources. ➢ Breeding Techniques: You'll gain knowledge on classical and modern breeding methods, including selection, hybridization, and mutation breeding. ➢ Seed Health Testing: You'll gain skills in seed health testing, including techniques for detecting seed-borne pathogens. ➢ Entomology Course Learning Outcomes- Understanding Insect Pests: You'll learn about the types of insect pests that affect crops, their life cycles, and how to identify them. ➢ Crop Protection: You'll understand how to apply entomological principles to protect crops from insect pests and reduce yield losses.		
Credit Value	(Theory 6 Credit) (Practical 4 Credit)		

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	Part B : Content of the Course
	Total number of Lecture Hours/ Week :4
Unit	Topic
I	1.1 Plant breeding- Introduction, objectives, Activities and important achievements. 1.2 Modes of Pollution in self & cross pollinated crop plant. 1.3 Self incompatibility- Definition, types, methods, induction and applications. 1.4 Germ Plasm conservation, center of origin and diversity. 1.5 Seed banks and role in crop improvements. 1.6 Plant introduction and Selection.
II	2.1 Hybridization- Definition, objectives and types. 2.2 Techniques of Hybidization 2.3 Improvement in self-pollinated crops through hybridization application. 2.4 Mutation breeding- Mutagens, procedure, precautions, applications and achievements. 2.5 Plant breeding work done in following crop-wheat, Maize, Cotton, Potato & Sugarcane.
III	3.1 Seed pathology- History, terminology and economic importance of seed pathology, seed industry and plant quarantine. 3.2 Important seed transmitted microbes and pathogens. 3.3 Storage fungi-their harmful effect on seeds, factor affecting them and control measures. 3.4 Mode of transmission mechanism of seed-borne Pathogens. 3.5 Types of losses caused by seed-borne diseases.
IV	4.1 Role of microorganisms in seed quality deterioration. 4.2 Management of seed borne plant Pathogens. 4.3 Different seed health testing methods for detecting microorganisms. 4.4 Methods of treatment to control seed borne diseases. 4.5 Mycotoxins- Producing fungi, types, detection and control measures.
V	5.1 Role of Insects in agriculture. 5.2 Principles, utility and relevance of seed entomology. 5.3 Insect morphology, feature of body parts and life cycle of following insects. (a) Honey bee (b) Lac insects (c) Termite (d) Lemon butterfly 5.4 Insecticides- Insecticide Act, Registration and quality control of insecticides, Safe use. 5.5 Mode of action and chemical nature of Insecticides. 5.6 Biological control and its significance.

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Part C : Learning Resources

Text Books , Reference Books, Other Resources

Texts/References:

- Agrawal PK & Dadlani M, (Eds.) 1992. Techniques in Seed Science and Technology. South Asian Publ.
- Baskin CC & Baskin JM. 1998. Seeds: Ecology, Biogeography and Evolution of Dormancy and Germination. Academic Press.
- Basra AS. 2006 Handbook of Seed Science and Technology. Food Product Press.
- Bench ALR & Sanchez RA. 2004. Handbook of Seed Physiology. Food Product Press.
- Bewley JD & M. 1982. Physiology and biochemistry of Seeds in Relation to Germination. Vols I, II. Springer Verlag.
- Bewley JD & Black M. 1985 Seed: Physiology of Seed Development and Germination. Plenum Press.
- Copeland LO & Mc Donald MB. 1995. Principles of Seed Science and Technology. 3rd Ed. Chapman & Hall.
- Khan AA. 1977. Physiology and biochemistry of Seed Dormancy and Germination. North Holland Co.
- Kigel J & Galili G. (Eds.). Seed Development and Germination. Marcel Dekker.
- Murray Dr. 1984. Seed Physiology. Vols. I, II, Academic Press.
- Sadasivam S & Manickam A. 1996. Biochemical Methods 2nd Ed. New Age.
- Feistritser, P and A.F. Kelly. 1970. Improved seed production, FAO, Rome, George, A.T.
- Thompson, J.R. 1977. Advances in Research and technology of Seed, Part. 3 & 4, Centre for Agricultural Publishing Documentation, Washington.
- Singh, K.N. and Branow, J.R. 1988. Pollen selection for heat tolerance in cotton. Crop. Sci. 28:857-859
- Singh, K.N. 1995. Recent approaches to breeding for salt tolerance in crop plants. In; Proc. Genetic Resaerch and Education: Current Trends & the Next fifty Years. (Eds.B.Sharma et.al.) Vol. I IndianSociety of Geneties and plant Breeding, New Delhi: 490-499.
- Vijendra Das, L.D. 2000. Problems Facing Plant Breeding, CBS Publishers, New Delhi.
- Roy, D. 2000 Plant Breeding-Analysis and Expoitation fo Variation.Narosa Publishing House, New Delhi.
- Gupta, P.K. 1985. Genetics. Rastogi Publications, Merut.
- Singh, B.D. 1990. Fundamentals of Genetics. Kalyani Publishers, Ludihiana.
- SiddiquiB.A. and Khan,S. 1999 Breeding in Crop Plants-Mutations & in vitro Mutation Breeding Kalyani Publishers,New Delhi
- Brown T.A. 1999 Genome.John Wiley & Sons, New York.
- R.T. Cotton (1963). Insect pests of stored grain and grain products. Burgess Publ. Co. Minn. USA
- J.A. Anderson and A.W. Aleock. 1954. Storageof cereal grain and their products. American assoc. Cereal chemist St. Pauls Minn.
- B.P. Khare 1972. Insect pests of stored grain and their control in U.P
- S.V. Pingale. Handling and storage of food grains
- R.N. Sinha and Khir. Storage of Food grain
- H.A.U. Monro. 1969. In Manual of Fumigation of insect control, FAO Rome Agric. Studies. No. 79.
- N.S. Agrawal and G.K. Grrish 1977. An introduction to action prograMM :e to redress on farm storage losses in India. FAO/NORAD Seminar Farm Storage grain in India. Nov. 29- Dec.8, 1977.

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Part D: Assessment and Evaluation (Theory)		
Maximum Marks: Continuous Comprehensive Evaluation (CCE): University Exam (UE): Time: **02.00 Hours**		**100** **40** **60**
Internal Assessment: Continuous Comprehensive Evaluation (CCE)	Class Test	**20**
	Assignment/Presentation	**20**
	Total	**40**
External Assessment: University Exam	Section (A): Three Very Short Questions (50 Words Each)	03 x 02 = 06
	Section (B): Four Short Questions (200 Words Each)	04 x 08 = 32
	Section (C): Two Long Questions (500 Words Each)	02 x 11 = 22
	Total	**60**

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RAJA SHANKAR SHAH UNIVERSITY, CHHINDWARA (M.P.)
DEPARTMENT OF SEED TECHNOLOGY
Syllabus Session: 2025-26
M.Sc. Seed Technology (1 Year Programme)
Semester -II
Paper- II

Part A: Introduction			
Program:	Class: M.Sc.	Semester: II	Session 2025-26
Subject : M.Sc. Seed Technology			
Course Code	CC-22		
Course Title	**Seed Marketing Management and Agriculture Statistics With Computer Application**		
Course Type	Core Course		
Pre-requisite (If any)	Graduation for any one B.Sc. Seed Technology		
Course Learning Outcomes	➢ Market Analysis: You'll learn how to analyze market trends, consumer behavior, and competitor activity in the seed industry. ➢ Marketing Strategy Development: You'll understand how to develop effective marketing strategies for seed products, including branding, pricing, and distribution. ➢ Seed Product Management: You'll gain knowledge on managing seed products, including product development, launch, and life cycle management. ➢ Computer Applications: You'll understand how to use computer software and programming languages, such as R or Python, to analyze and interpret agricultural data. ➢ Data-Driven Decision Making: You'll gain skills in using data analytics to inform decision-making in agriculture, including crop management, soil science, and farm management.		
Credit Value	(Theory 6 Credit) (Practical 4 Credit)		

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Part B : Content of the Course	
Total Number of Lecture Hours/ Week :4	
Unit	Topic
I	1.1 Importance and promotion of quality seeds, formal and informal seed supply systems. 1.2 Basic concept of seed marketing, direct marketing and contract marketing. 1.3 Marketing corporation. 1.4 Market research and market information services. 1.5 National seed policies.
II	2.1 Importance and scope of seed industry in India. 2.2 Major problems in seed industry, Role of seed association/ Federations in seed trade. 2.3 Seed marketing intelligence and product Mix. 2.4 Problems of marketing in demand and supply sales promotion, distribution channels. 2.5 Marketing costs and margins.
III	3.1 Definition, aims, characteristics and limitations of statistics, Classification and tabulation of data. 3.2 Measures of central tendencies and measures of dispersion. 3.3 Definition, merits and demerits of complete enumerate and sample survey, Concept of unit and population, Random sampling. 3.4 Tests of significance – Z- test, F-test, Chi-square test and students t test. 3.5 Basic principles of experimental design, Description and analysis of CRD, RBD, Split-plot, LSD and Missing-plot techniques.
IV	4.1 Introduction of computer. A brief history of computing Data processing and information. 2-characteristics of the computer, function, capability and limitation. Strength and weakness of computer. 4.2 Generation of computer, First, Second. Third fourth and fifth generation computer with their features only, types of computer. 4.3 Digital Analog and Hybrid computers Classification of computers on size and capabilities of micro- Mini-, Mainframe and Super Computer.
V	5.1 Anatomy and components of computer, computer organization CPU, ALU, Input and Output devices peripheral devices, storage units hard disk, compact disk, various types of memories. 5.2 RAM, ROM, PROM and ERPOM. Numbers systems, Decimal, Binary, Octal, Hexadecimal, Character code ASCH, EBCDID BCD. 5.1 5.3 Types of software, system software and application software, Introduction to DOS, (Disk operating system). Fundamentals of DOS commands, Internal commands, external commands, files and directory Editor. Elementary Idea to Basic (Computer Language).

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Part C: Learning Resources
Text Books, Reference Books , Other resources
Suggested Readings: 1- Kohls RL & UHI JN. 1980. Marketing of Agricultural Products. MacMillan. 2- Kundu KK & Suhag KS. 2006. Teaching Manual on Seed Marketingand Management. Department of Agricultural Economics CCS HAU Hisar. 3- Venugopal P.2004. State of Indian Farmers: A Millenmium Study. Vo. VIII. Input Management. Academic Foundation, Department of Agriculture and Cooperation, Ministry of Agriculture, New Delhi. 4- Agarwal VK & Sinclair JB. 1997. Principles of Sedd Pathology. Boca Ratan. 5- Karuna V. 2007. Seed Health Testing. Kalyani. 6- Books related Computer Application. 7- Books related Bio-Statistics.

Part D: Assessment and Evaluation (Theory)		
Maximum Marks: Continuous Comprehensive Evaluation (CCE): University Exam (UE): Time: **02.00 Hours**		**100** **40** **60**
Internal Assessment: Continuous Comprehensive Evaluation (CCE)	Class Test	**20**
	Assignment/Presentation	**20**
	Total	**40**
External Assessment: University Exam	Section (A): Three Very Short Questions (50 Words Each)	03 x 02 = 06
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	Total	**60**

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RAJA SHANKAR SHAH UNIVERSITY, CHHINDWARA (M.P.)

DEPARTMENT OF SEED TECHNOLOGY

Syllabus Session 2025-26

M.Sc. Seed Technology **(1 Year Programme)**

Class: II Sem.

Practical - I

Part A: Introduction			
Program:	Class: M.Sc.	Semester : II	Session 2025-26
Subject : M.Sc. Seed Technology			
Course Code	**PC-21**		
Course Title	**Plant Breading, Seed Pathology and Entomology**		
Course Type	Core Course		
Pre-requisite (If any)	Graduation for any one B.Sc. Seed Technology		
Course Learning Outcomes	➢ Seed Production and Quality: You'll learn how seed production programs are designed and how to improve seed quality aspects. ➢ Seed Pathology Course Learning Outcomes- Understanding Seed-Borne Diseases: You'll learn about the types of seed-borne pathogens, their impact on seed quality, and how to detect and manage them. ➢ Insect Pest Management: You'll gain knowledge on integrated pest management strategies, including cultural, biological, and chemical controls.		
Credit Value	(Theory 6 Credit) (Practical 4 Credit)		

Part B: Content of the Practical Course
Total numbers of Lectures (in hours per week): 8 hours per week Total Lectures: (15*8) 120 hours
List of Practicals:- 1. To study by visits to regulatory seed testing laboratory, including plant quarantine lab and seed certification agency. 2. To study by different methods of examination of seeds to assess seed-borne microorganisms and to quantify infection percentage. 3. Detection of seed-born fungi, Bacteria and viruses. 4. Identification of storage fungi. 5. To study by control of seed borne diseases. 6. To study by seed treatment methods. 7. To study the Insect morphology of different insects. 8. Preparation of Insect herbarium 9. To study various types of insecticides. 10. Identification of nature and damage of different insects. 11. To study Life cycle of different insects. 12. Identification of insecticide machineries.

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Part C: Learning Resources

Text Books, Reference Books, Other resources

Suggested Readings:

- Copeland LO & Mc Donald MB. 1995. Principles of Seed Science and Technology. 3rd Ed. Chapman & Hall.
- Khan AA. 1977. Physiology and biochemistry of Seed Dormancy and Germination. North Holland Co.
- Kigel J & Galili G. (Eds.). Seed Development and Germination. Marcel Dekker.
- Murray Dr. 1984. Seed Physiology. Vols. I, II, Academic Press.
- Sadasivam S & Manickam A. 1996. Biochemical Methods 2nd Ed. New Age.
- Feistritser, P and A.F. Kelly. 1970. Improved seed production, FAO, Rome, George, A.T.
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- Singh, K.N. and Branow, J.R. 1988. Pollen selection for heat tolerance in cotton. Crop. Sci. 28:857-859
- Singh, K.N. 1995. Recent approaches to breeding for salt tolerance in crop plants. In; Proc. Genetic Resaerch and Education: Current Trends & the Next fifty Years. (Eds.B.Sharma et.al.) Vol. I IndianSociety of Geneties and plant Breeding, New Delhi: 490-499.
- Vijendra Das, L.D. 2000. Problems Facing Plant Breeding, CBS Publishers, New Delhi.
  Roy, D. 2000 Plant Breeding-Analysis and Expoitation fo Variation.Narosa Publishing House, New Delhi.

Part D : Assessment and Evaluation (Practical)	
Scheme of Practical Examination: -	**Max. Marks: 40 +60 =100**
Internal Assessment	**Max. Marks-40**
Class Interaction	10
Quiz	10
Seminar	10
Assignments (Charts, Rural Service, Technology Dissemination/ Excursion/ Lab Visit/Industrial Training	10
External Assessment	**Max. Marks-60**
Major experiment	10
Minor Experiment-1	10
Minor Experiment-2	10
Spotting	10
Viva-Voce	10
Practical Record	10

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RAJA SHANKAR SHAH UNIVERSITY, CHHINDWARA (M.P.)

DEPARTMENT OF SEED TECHNOLOGY

Syllabus Session 2025-26

M.Sc. Seed Technology **(1 Year Programme)**

Class: II Sem.

Practical - II

Part A: Introduction			
Program:	Class: M.Sc.	Semester : II	Session 2025-26
Subject : M.Sc. Seed Technology			
Course Code	**PC-22**		
Course Title	**Seed Marketing Management and Agriculture Statistics With Computer Application**		
Course Type	Core Course		
Pre-requisite (If any)	Graduation for any one B.Sc. Seed Technology		
Course Learning Outcomes	➢ Understanding Seed Marketing Principles: You'll grasp the fundamental principles of seed marketing, including market segmentation, targeting, and positioning. ➢ Statistical Analysis: You'll learn statistical techniques to analyze agricultural data, including descriptive statistics, inferential statistics, and data visualization. ➢ Research Methods: You'll learn research design, sampling methods, and data collection techniques for agricultural studies		
Credit Value	(Theory 6 Credit) (Practical 4 Credit)		

Part B: Content of the Practical Course
Total numbers of Lectures (in hours per week): 8 hours per week Total Lectures: (15*8) 120 hours
List of Practicals:- 1- To study the different methods of examination of seeds to assess seed-borne microorganisms and to quantify infection percentage. 2- Identification of seed borne fungi, bacteria and viruses. 3- Identification of storage fungi. 4- To study by Control of seed borne diseases. 5- Seed treatment methods. 6- To study by statutory requirements in seed business including R&D. 7- Measures of Central Tendencis 8- Measures of Dispersion 9- Chi-square test of goodness of fit 10- Experimental designs.

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Part C: Learning Resources

Text Books, Reference Books, Other resources

Suggested Readings:

- Copeland LO & Mc Donald MB. 1995. Principles of Seed Science and Technology. 3rd Ed. Chapman & Hall.
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Part D : Assessment and Evaluation (Practical)	
Scheme of Practical Examination: -	**Max. Marks: 40 +60 =100**
Internal Assessment	**Max. Marks-40**
Class Interaction	10
Quiz	10
Seminar	10
Assignments (Charts, Rural Service, Technology Dissemination/ Excursion/ Lab Visit/Industrial Training	10
External Assessment	**Max. Marks-60**
Major experiment	10
Minor Experiment-1	10
Minor Experiment-2	10
Spotting	10
Viva-Voce	10
Practical Record	10

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