Scheme for M.Sc. SEED TECHNOLOGY NEP 2020

For One Year PG programme

Scheme C-1: (For the course of science having major practicum components)

M.Sc. Seed Technology I Semester

S.No.	Course Code	Course Name	Total Marks	Credit (s)	End Semester Exam Marks		Internal Marks	
					Max.	Min.	Max.	Min.
1.	CC-11	Seed Production of Cereals, Pulses, Oil Seeds, Fiber and Fodder Crops and Vegetables	100	6	60	24	40	16
2.	CC-12	Seed Processing, Seed Storage and Seed Quality Testing	100	6	60	24	40	16
3.	PC-11	Practical - I	100	4	60	24	40	16
4.	PC-12	Practical – II	100	4	60	24	40	16
		Grand Total		**20**				

23/9/25

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

Part A: Introduction			
Program:	Class: M.Sc.	Semester : I	Session 2025-26
Subject : M.Sc. Seed Technology			
Course Code	**CC-11**		
Course Title	**Seed Production of Cereals, Pulses, Oil Seeds, Fiber and Fodder Crops and Vegetables**		
Course Type	Core Course		
Pre-requisite (If any)	Graduation for any one B.Sc. Seed Technology		
Course Learning Outcomes	➢ **Seed Production Principles**: Learners will grasp the fundamental principles of seed production, including genetic purity, quality testing, and techniques for self-pollinated and cross-pollinated crops. ➢ **Isolation**: Preventing cross-pollination between different varieties or species. ➢ **Bagging**: Protecting emasculated flowers from unwanted pollination. ➢ **Genetic Purity Testing**: Evaluating seed samples for impurities or off-types. ➢ **Vigor Testing**: Evaluating seed health and robustness. ➢ **Crop-Specific Seed Production**: Learners will gain knowledge on seed production techniques for specific crops, including cereals, pulses, oilseeds, fiber crops, and vegetables.		
Credit Value	(Theory 6 Credit) (Practical 4 Credit)		

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23/5/25

	Part B : Content of the Course
	Total number of Lecture Hours/ Week :4
Unit	Topic
I	**Cereals :–** 1.1. Basic principles in Seed production and. importance of Quality seed. 1.2. Floral structure, breeding and pollination, methods of seed production in – (a) Wheat (d) Paddy (b) Maize (e) Sorghum (c) Maize fodder (f) Oats
II	**Pulses :-** Floral structure, breeding and pollination, methods of seed production in (a) Pigeon pea (d) Chick pea (b) Green gram (e) Berseem (c) Lucerne
III	**Oil Seeds :-** Floral structure, breeding and pollination, methods of seed production in 1. Ground nut (d) Soybean 2. Mustard (e) Sunflower 3. Linseed (f) Seasamum
IV	**fiber Crops** Floral structure, breeding and pollination, methods of seed production in (a) Cotton (c) Jute (b) Sunhemp (d) Coir
V	**Vegetables** Floral structure, breeding and pollination, methods of seed production in Chili 1) Chilli (d) Tomato 2) Brinjal (e) Coriander 3) Potato (f) Ginger

23/9/25

Part C : Learning Resources

Text Books , Reference Books, Other Resources

Texts/References:

1- Kelly AF. 1988. Seed Production fo Agricultural Crops.
2- John Wiley. McDonald MB Jr & Copeland Lo. 1997. Seed Production; Principles and Practices. Chapman & Hall.
3- Sinclair T.R. and F.P. Gardner, 1977. Principles of Econogy in plant production, CAB international G.K.
4- Rai, M. and S. Mauria, 1995, Hybrid Resarch and Development. Indian Society of Seed Technology, IARI, New Delhi.
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7- Bagga, S.S. and Bagga, S.K. 1998. An introduction in hybrid cultivar development. Narosa Pub.House, New Delhi.
8- Agarwal RL. 1997. Seed Technology. 2nd Ed. Oxford & IBH.
9- Chhabra AK. 2006 Practical Manual of Floral Biology of Crop Plants. Dept. of Plant Breeding CCS HAU, Hisar.
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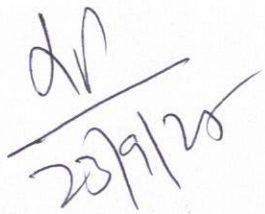
12- Neeergaard, P. 1977. Seed pathology, Macmillan Press Ltd. Lodon.
13- Mehrotra, R.S. and Agrawal, Ashok. 2003 (2nd Ed.) Plant Pathology, McGraw Hill Educaiton (India) Private Limited. New Delhi.
14- Agrios, G.N. 1994. Plant Pathology. Fourth Edition, Academic Press, San Diego, California.
15- Dimcock, N. and S.B. Promrose. 1994. Introduction to Modern Virology, Blackwell Science, Oxford.
16- Singh R.S. 1998. Plant Diseases, Oxford and IBH Publication Co. Pvt.Lt., New Delhi.
17- Anon 1965. Field Inspection Manual and Minimum Seed Certification Standards, NSC Publications, New Delhi
18- International Seed Testing Association (ISTA) 1997. Hand book of seedling evaluations, Scientific Publishers, Jodhpur.
19- Martin, C. and D. Barkley, 1961. Seed identification manual, Oxford and IBH Publishing Co, Calcutta,
20- Nema, N.P. 1987. Principles of Seed Certification and Testing. Allied Publishers Pvt.Ltd, New Delhi.
21- Tunwar, N.S. and S.V. Singh, 1988 Indian Minimum Seed Certification Standards, Central Seed Certification Board, New Delhi.

23/9/25

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**



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-12
Course Title	**Seed Processing, Seed Storage and Seed Quality Testing**
Course Type	Core Course
Pre-requisite (If any)	Graduation for any one B.Sc. Seed Technology
Course Learning Outcomes	➢ **Seed Processing**: You'll understand the principles and techniques of seed processing, including cleaning, drying, and packaging seeds to maintain their quality and viability. ➢ **Seed Storage**: You'll learn about the importance of proper seed storage conditions, such as temperature, humidity, and ventilation, to preserve seed quality and longevity. ➢ **Seed Quality Testing**: You'll gain knowledge on various seed quality testing parameters, including: ➢ **Germination Testing**: assessing seed viability and germination rates ➢ **Purity Testing**: evaluating seed purity and detecting impurities or off-types ➢ **Vigor Testing**: assessing seed health and robustness ➢ **Disease Testing**: detecting seed-borne pathogens ➢ **Moisture Content**: measuring seed moisture levels to prevent deterioration
Credit Value	(Theory 6 Credit) (Practical 4 Credit)

23/9/25

Part B : Content of the Course	
Total Number of Lecture Hours/ Week :4	
Unit	Topic
I	1.1 Introduction & Principles of seed processing, Methods of seed drying, 1.2 Relative humidity and equilibrium, RH content of seed. 1.3 Loss of viability in important agricultural and horticultural crops 1.4 Assembly line of processing and storage
II	2.1 Seed storage -seed drying and storage, drying methods, factors affecting it 2.2 Concept and significance of moisture equilibrium, Methods of maintaining Safe seed moisture content. 2.3 Methodes to minimize the loss of seed vigour and vitality. 2.4 factors influencing storage Losse, Storage methods and godown sanitation, 2.5 Storage problems of recalcitrant seed and their conservation,
III	3.1 Objective, concept and components in seed Quality control 3.2 Instruments, devices and tools used in seed Testing, I STA and its role in seed testing. 3.3. Seed sampling - definition, objectives, seed lot and its size, types of samples, sampling devices. 3.4. Procedure of seed sampling, methods of preparing Composite and submitted samples, subsampling techniques, dispatach receipt and registration of testing laboratory. 3.5. Physical purity - definition, objectives and procedures, weight of working samples for physical purity analysis. components of purity analysis and then criteria. 3.6. Calculation and reporting of results, prescribed seed purity Standards.
IV	4.1 Seed moisture content; importance of equilibrium principles and methods of moisture estimation- types, instruments and devices used. 4.2 Pre-drying and grinding requirements, procedural steps in moisture estimation; calculation and reporting of results. 4.3 Germination; importance; definitions; requirements for germination, instrument and substrata required; principle and methods of seed germination testing; working sample and choice of method. 4.4 General procedure for each type of method; duration of test; seedling evaluation; calculation and reporting of results. 4.5 Dormancy; definition, importance, causal mechanisms, types and methods for breaking dormancy.
V	5.1 Viability and Vigour testing, definition and importance of viability test, different viability test, quick viability tests, advantages. 5.2 Vigour testing-concept, historical development, definitions, principles and procedure of different methods used for testing vigour 5.3 Genetic purity testing - objectives & criteria. 5.4 Seed health testing - field and seed standards, designated diseases, objectionable weeds 5.5 Significance of seed borne diseases as seed quality - seed health testing.

23/7/25

Part C: Learning Resources
Text Books, Reference Books , Other resources
Suggested Readings: 1. Agarwal RL. Seed Technology. Oxford & IBH Publishing, Co. Pvt. Ltd, NewDelhi.1980. 2. Nema NP. Principles of Seed Certification and Testing. Allied Pubis. 1986. 3. Tunwar NS & Singh SN. Indian Minimum Seed Certification Standards. CSCB,Ministry of Agriculture, New Delhi. I988. 4. Bhojwani SS & Bhatnagar SP. The Embryology of Angiosperm. Vikas Publ.I999. 5. Pandey, B.P. Embryology of Angiosperms. S. Chand & Comp. New Delhi, 1997. 6. Singhal NC. Hybrid Seed Production in Field Crops. Kalyani Publ.2003 7. Harpal Singh Tomar. Seed technology. Aman Publishing House, Meerut, 2014. 8. Black M, Bewley D & Halmer P. The Encyclopedia of Seeds: Science,Technology and Uses. CABI. 2006 9. Copeland LO & McDonald MB. Principles of Seed Science and Technology. 4thEd. Chapman & Hall. 2001. 10. Jat D. and Jat A. Beej Prodhyogiki- I Shiva Prakashan Indore 2017

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**
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	Total	**60**

23/9/25

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-11**		
Course Title	**Seed Production of Cereals, Pulses, Oil Seeds, Fiber and Fodder Crops and Vegetables**		
Course Type	Core Course		
Pre-requisite (If any)	Graduation for any one B.Sc. Seed Technology		
Course Learning Outcomes	➢ **Roguing**: Removing off-type and diseased plants to maintain genetic purity. ➢ **Emasculation**: Removing male reproductive organs to encourage controlled cross-pollination. ➢ **Quality Testing**: Learners will understand the importance of quality testing in seed production, including: ➢ **Germination Testing**: Assessing seed viability and germination rates. ➢ **Disease Testing**: Detecting seed-borne pathogens.		
Credit Value	(Theory 6 Credit) (Practical 4 Credit)		

23/9/25

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. Floral structure, breeding and pollination mechanism of cross and self-pollinated crops.
2. Seed production of cross-pollinated plants (land, isolation, planting ratio, emasculation, pollination etc.).
3. Identification of rogues and pollen shedders.
4. To study of major fiber, fodder, vegetables, spices and aromatic plants of our locality.

Part C: Learning Resources

Text Books, Reference Books, Other resources

Suggested Readings:

1- Rai, M. and S. Mauria, 1995, Hybrid Resarch and Development. Indian Society of Seed Technology, IARI, New Delhi.

2- Feistrizer, P and A.F. Kelly, 1978. Improved Seed Production, FAO, Rome.

3- Habbiethwaite, P.D., 1980. Seed Production, butter worths, London-Boston, Sydney Wellington-Durban Toronto.

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7- Desai, B.B, P.M. Kotecha and K. Salunkha, 1997. Seeds handbook, Published by mercel Dekker INC, New York.

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9- Neeergaard, P. 1977. Seed pathology, Macmillan Press Ltd. Lodon.

10- Singh R.S. 1998. Plant Diseases, Oxford and IBH Publication Co. Pvt.Lt., New Delhi.

11- Anon 1965. Field Inspection Manual and Minimum Seed Certification Standards, NSC Publications, New Delhi

International Seed Testing Association (ISTA) 1997. Hand book of seedling evaluations, Scientific Publishers, Jodhpur.

23/9/25

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

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-12**		
Course Title	**Seed Processing, Seed Storage and Seed Quality Testing**		
Course Type	Core Course		
Pre-requisite (If any)	Graduation for any one B.Sc. Seed Technology		
Course Learning Outcomes	➢ You'll understand the principles and techniques of seed processing, including cleaning, drying, and packaging seeds to maintain their quality and viability. ➢ You'll learn about the importance of proper seed storage conditions, such as temperature, humidity, and ventilation, to preserve seed quality and longevity. ➢ You'll gain knowledge on various seed quality testing parameters, including: ➢ Assessing seed viability and germination rates ➢ Evaluating seed purity and detecting impurities or off-types ➢ Detecting seed-borne pathogens ➢ Measuring seed moisture levels to prevent deterioration ➢ Assessing seed health and robustness		
Credit Value	(Theory 6 Credit) (Practical 4 Credit)		

23/9/25

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 Seed health testing in production of good quality seeds.
2. To study Seed storage and Seed treatment methods.
3. To study the Packaging, bagging and labelling techniques with proper tagging of different seeds.
4. Identification methods for maintain the safe seed moisture content.
5. To study different methods of minimizing losses seed vigour and viability.
6. Identification of Storage methods and godown sanitation.
7. Identification of Storage problems of seed.
8. To study the Seed structure of monocot and dicot seeds.
9. Identification of seeds of weeds and crops.
10. Estimation of seed moisture content.

Part C: Learning Resources

Text Books, Reference Books, Other resources

Suggested Readings:

1- Kelly AF. 1988. Seed Production fo Agricultural Crops.

2- John Wiley. McDonald MB Jr & Copeland Lo. 1997. Seed Production; Principles and Practices. Chapman & Hall.

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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

23/9/25