



TEACHING PLAN: PRINCIPLES OF SEED TECHNOLOGY

SCHOOL: SOHSS		ACADEMIC SESSION: 2023-2024		FOR STUDENT’S BATCH: 2 nd Year 4 th Semester	
1	Course Code	AGN-202			
2	Course Title	PRINCIPLES OF SEED TECHNOLOGY			
3	Credits	3			
4	Learning Hours		Contact Hours	72	
			Assessment	10	
			Guided Study	18	
			Total hours	100	
5	Course Objective	1. This course provides an understanding and study of different methods of seed production in cereal, pulses, vegetables, oilseeds and fodder crops. 2. The main objective of the seed technology subject is to understand the processing, preservation and marketing of different crops. 3. It also presents an overview of seed quality, seed storage and seed treatment. 4. The course also provides understanding towards the acts related to seed and seed certification. 5. The testing of seed for quality assessment can be learned from this course.			
6	Course Outcomes	1. Students will be able to define and types of seed, scope of seed technologist and relation of seed technology with other branches of agriculture. 2. Students will be able to understand different methodology of seed production for each crop. 3. Students will be able to evaluate and understand acts related to seed and at the end need of various act related to seed. 4. Students will be able to learn different method to assess the quality of seed and prevent seed from deterioration. 5. Students will also be able to understand importance and types of seed quality, seed storage and techniques of different seed treatment and seed marketing.			
7	Outline Syllabus:				
7.01	Paper Code	Unit		Reference Number	Teaching Methods
7.02	AGN-202	UNIT-I INTRODUCTION OF SEED TECHNOLOGY AND IMPORTANCE	a) Seed and seed technology: introduction, definition and importance b) Deterioration causes of crop varieties and their control c) Maintenance of genetic purity during seed production	Phundan Singh, Principles of Seed Technology pp. 1-22 & 92-97	Lecture , PPT

		UNIT-II SEED QUALITY, CLASSES OF SEED, SEED PRODUCTI ON METHODS, SEED ACT AND SEED CERTIFICA TION	a) Seed quality; Definition, Characters of good quality seed b) Different classes of seed c) Foundation and certified seed production of important cereals, pulses, oilseeds, fodder and vegetables d) Seed certification, phases of certification, procedure for seed certification, field inspection e) Seed Act and Seed Act enforcement, Duty and powers of seed inspector, offences and penalties, Seeds Control Order 1983	Phundan Singh, Principles of Seed Technology pp. 23-39 & 114-140 R.L. Agarwal, Seed Technology pp.	Lecture and PPT
		UNIT-III SEED TESTING, SEED PROCESSING AND SEED STORAGE	a) Varietal Identification through Grow Out Test and Electrophoresis, Molecular and Biochemical test, Detection of genetically modified crops, Transgene contamination in non-GM crops b) GM crops and organic seed production c) Seed drying, processing and their steps and seed testing for quality assessment d) Seed treatment, its importance, method of application and seed packing, Seed storage; general principles, stages and factors affecting seed longevity during storage and Measures for pest and disease control during storage	Phundan Singh, Principles of Seed Technology pp. 40-47 & 48-91	Lecture and PPT
	7.03	UNIT-IV: CONCEPT OF SEED MARKETIN G	a) Seed marketing: structure and organization, sales generation activities, promotional media b) Factors affecting seed marketing, Role of WTO and OECD in seed marketing c) Private and public sectors and their production and marketing strategies	Phundan Singh, Principles of Seed Technology pp. 141-169	Lecture and PPT
8	Course Evaluation				
8.1	COURSE ASSESEMENT: 50%				
8.1.1	Attendance	5 %			
8.1.2	Homework	5 %			
8.1.3	ClassTest	5 %			
8.1.5	Presentation	5%			
8.1.6	Any other	20%			

8.2	MTE	10%
8.3	End-term examination: 50%	
9	Text Books & References	
9.1	Text book	1. Agarwal, R.L. Seed Technology, 2019. Oxford and IBH publishing house, New Delhi. 2. Singh, P. Principles of Seed Technology, Kalyani Publisher, New Delhi. 3. Bhale, M. S. and Khare, D. <i>Seed Technology</i> 2ND REVISED & ENLARGED EDITION (2018) 4. N. C. Singhal <i>Seed Science and Technology</i> Kalyani Publishers, New Delhi. 2nd Revised Edition, 2016.
9.2	Reference	1. Agarwal, V.K. & Gupta, M.C. Loose smut of wheat – A treat to seed production. <i>Seed Res.</i>, 17(1): 55-68. 2. Gill, H. And Tomar, B. 1991. Vegetable statistics at Galance. Indian Agricultural Research Institute, New Delhi, India, Tech. Bull. No. 4.
9.3	Video References	1. https://www.youtube.com/watch?v=FSq52LnO9Rw 2. https://www.youtube.com/watch?v=j6MwsmmYql8&list=PLMwQyDnbQLRWkULTTg3wMpi8YK04PnzzP 3. https://www.youtube.com/watch?v=7748hwRbJvM&list=PLvSukZ-l0KuMRf9HRpd9I2ADa9tnJ-pR3 4. https://www.youtube.com/watch?v=2qt_gXQDTUY 5. https://www.youtube.com/watch?v=ZmEbkVgG_wQ 6. https://www.youtube.com/watch?v=fKdqSyZF4XQ 7. https://www.youtube.com/watch?v=2fOUhxxJaX8&list=PLhI9PLSXEf68pMkVAzR0NhbXBH1Jkcc1f 8. https://www.youtube.com/watch?v=YKxPEoCNTVM

Mapping of Outcomes v. Topics

Outcome no. → Syllabus topic↓	1	2	3	4	5
Paper Code. Unit I (a)	✓				
Paper Code. Unit I (b)	✓				
Paper Code. Unit I (c)	✓				
Paper Code. Unit II (a)			✓		
Paper Code. Unit II (b)		✓			
Paper Code. Unit II (c)		✓			
Paper Code. Unit II (d)			✓		
Paper Code. Unit II (e)			✓		
Paper Code. Unit III (a)				✓	
Paper Code. Unit III (b)				✓	✓
Paper Code. Unit III (c)				✓	✓
Paper Code. Unit III (d)				✓	✓
Paper Code. Unit IV (a)					✓
Paper Code. Unit IV (b)					✓
Paper Code. Unit IV (c)					✓

Question Bank

Unit-I

A) Multiple choice questions

1. Central seed testing laboratory is located at
 - a) Bangalore
 - b) Hyderabad
 - c) New Delhi
 - d) Varanasi
2. ISTA is located at
 - a) New Delhi
 - b) Munich
 - c) Rome
 - d) Zurich
3. NSC was established in
 - a) 972
 - b) 1971
 - c) 1963
 - d) 1967
4. Seed certification standard for India is fixed by
 - a) ISTA
 - b) Central Seed Certification Board
 - c) AOSSCA
 - d) PPV and FRA
5. The crop with lowest seed multiplication ratio is
 - a) Field pea
 - b) Sesame
 - c) Coconut
 - d) Groundnut

B) Write short notes on the following

1. Describe various objective of seed technology
2. Define seed and describe its characteristics
3. Define grain and describe its characteristics
4. Differentiate between seed and grain
5. Define seed technology and describe its importance

C) Descriptive question

1. Discuss the relationship of seed technology to other sciences
2. Explain in detail about the characteristics of good seeds
3. Define improved seed and describe the goals of seed technology
4. Discuss improved seed as carrier of new technology and basic tool for secured food supply

Unit-II

A) Multiple choice questions

1. Foundation and Certified seed production and procurement of Breeder, Foundation and Certified seed is the role of
 - a) Seed Certification Agency
 - b) Seed Corporation

- c) Agricultural University
 - d) ICAR
2. Plants of the same crop grown in the field due to shattered seeds of previous season crop/variety along with the present season crop is known as
 - a) Assistant plant
 - b) Pollen shedder
 - c) Volunteer plant
 - d) Weed
 3. Undesirable natural out crossing has
 - a) No effect on morphology of the produced seed
 - b) Seed will be of larger seed size
 - c) Significant alteration on morphology of produced seed
 - d) Seed will be or darker in colour
 4. Deterioration of a variety when the proportion of different states of unnoticed traits may reach equilibrium by natural selection and express in new environment is known as
 - a) Genetic drift
 - b) Residual Segregation
 - c) Genetic shift
 - d) Natural selection
 5. Cause of variation during seed multiplication that cannot be controlled by seed producer is
 - a) Out crossing
 - b) Mutation
 - c) Residual segregation
 - d) Recombination

B) Write short notes on the following

1. Describe the seed act 1966
2. Differentiate between the Seed Act 1966 and Seed control Order 1983
3. Write short notes on seed certification agency
4. Write short notes on Central Seed Certification Board (CCSB)
5. Write short notes on State Seed Certification Agencies (SSCA)

C) Descriptive question

1. Define seed certification and describe its objectives
2. Describe the duties and responsibilities of seed certification officers
3. Explain the procedure for certification of seeds
4. Explain in detail about classes of seeds
5. Discuss deterioration causes of crop varieties and their control

Unit-III

A) Multiple choice questions

1. Seeds that may withstand dehydration without damage are considered as.
 - a) Dormant seed
 - b) Recalcitrant seed
 - c) Orthodox seed
 - d) Hard seed

2. Elements of Group XVII of periodic table are known as
 - a) Hydrogen
 - b) Nitrogen
 - c) Helium
 - d) Halogen
3. Replacement of one atom with halogen is known as halogenation
 - a) Carbon
 - b) Nitrogen
 - c) Oxygen
 - d) Hydrogen
4. The halogen is absorbed by of the seed and reduces the physiological deterioration
 - a) Protein
 - b) Carbohydrate
 - c) Unsaturated fatty acid
 - d) Saturated fatty acid
5. The Halogen protect seed during storage due to property
 - a) Antimicrobial
 - b) Fumigation
 - c) Repellent
 - d) Attractant

B) Write short notes on the following

1. What is seed testing? Describe the importance of seed testing
2. What is seed processing? Describe briefly its significance
3. Describe various steps involve in seed processing
4. Write short notes on seed storage
5. Write short notes on treating and packaging

C) Descriptive question

1. Discuss the factors affecting seed longevity in storage
2. Define seed treatment and discuss its benefits
3. Describe the equipment used for seed treatment
4. Discuss GM crops and organic seed production
5. Describe the detection methods for GMOs/LMOs

Unit-IV

A) Multiple choice questions

1. The essential commodities act, was enacted in the year
 - a) 1950
 - b) 1955
 - c) 1960
 - d) 1968
2. Seeds control order under the essential commodities act, 1955 was enacted in the year.

- a) 1981
 - b) 1983
 - c) 1987
 - d) 1988
3. Consumer protection act was enacted in the year
- a) 1984
 - b) 1986
 - c) 1988
 - d) 2000
4. Environment protection act, with its 1989 Rules pertaining to genetically modified organisms was enacted in the year
- a) 1986
 - b) 1989
 - c) 2002
 - d) 2006
5. New Policy on seed development was enacted in the year
- a) 1985
 - b) 1988
 - c) 1998
 - d) 2008

B) Write short notes on the following

1. Write short notes on International trade
2. Write short notes on the role of WTO
3. Write short notes on organisation for economic cooperation and development
4. Write short notes on seed marketing
5. Write short notes on demand forecast

C) Descriptive question

1. Discuss in detail about the different aspect of seed marketing
2. Describe in detail about the factors affecting seed marketing
3. Discuss in detail about seed pricing policy
4. Discuss the factors affecting the final marketing price
5. Write detail notes on OECD seed scheme
