DEPARTMENT OF AGRONOMY
Faculty of Agricultural Sciences
University of the Punjab, Lahore

Course Outline

Programme	B.Sc. (Hons.) Agriculture (Agronomy)	**Course Code**	AGR-306	**Credit Hours**	3 (2-1)
Course Title	**SEED PRODUCTION TECHNOLOGY**				

Course Introduction

Some basic knowledge about seed, its production and testing techniques.
The goal is to familiarize the students with the fundamentals of Seed Technology and enhance their understanding of seed testing techniques.

Learning Outcomes

On the completion of the course, the students will:

1. To introduce Students to the Concept of Seed
2. Seed varieties, types and testing techniques
3. Importance of seeds in agriculture and different seed centres

	Course Content	**Assignments/Readings**
Week 1	1.1. Introduction, orientation 1.1.1. Introduction to Seed Technology, overview of Syllabus 1.2. Concept and perspective of seed technology 1.2.1. Seed Definition, Seed vs. Grain, Seed Science, morphology, technology,	Online Web Sources
	Practical Work Overview of Practical	
Week 2	1.3. Seed production terms and their definition 1.3.1. Varietal and hybrid seed production, variety vs Cultivar 1.4. Types of seeds 1.4.1. Monocot vs Dicot differences	Principles of Seed Production and Technology by Lawrence & MB McDonald, Page no. 72-73
	Practical Work Seed identification	

Week 3	1.5. Origin of Seed Industry 1.5.1. Origin of the seed industry in the world and Pakistan, Seed Act 1.6. National and International Seed Centers 1.6.1. Seed Distribution Centers include public, federal, and research institutions, as well as private, local, and multinational companies.	Seed Production Principles and Practices by MB McDonald & Lawrence, Page no. 136-140, Wikipedia, Online Web sources
	Practical Work Seed testing equipment	
Week 4	1.7. Lecture 1: Origin of new varieties 1.7.1. Overview of Variety Development 1.8. Lecture 2: Variety development and plant variety production 1.8.1. Detailed study of seed production technique through selection, plant breeding, biotechnology	Seed Production Principles and Practices by MB McDonald & Lawrence, Page no. 12-18
	Practical Work Study of seed structures	
Week 5	1.9. Seed problems overview 1.9.1. Overview of Problems, genetic variations, mechanical mixing, weeds, mutation, diseases, plant breeding 1.10. Germination, stand failures, mixtures, weeds, genetics 1.10.1. Factors affecting seed failures, genetic variations, mechanical mixing, weeds, mutation, diseases, and plant breeding.	Online Web Sources
	Practical Work Sampling techniques for seed testing	
Week 6	1.11. Seed certification classes: Nucleus breeder seed, pre-basic (Continue) 1.11.1. Overview of Seed classes, their names and developing techniques. 1.12. Seed certification classes: Nucleus breeder seed, pre-basic 1.12.1. Developing techniques of these classes and their tag colour.	Principles of Seed Production and Technology by Lawrence & MB McDonald, Page no. 297-300
	Practical Work Moisture testing	

Week 7	1.13. Basic, certified and approved seed classes (Continue) 1.13.1 Developing techniques of Basic, certified and approved seed classes. 1.14. Basic, certified and approved seed classes 1.14.1. Developing techniques of Basic, certified and approved seed classes and their tag colour.	Principles of Seed Production and Technology by Lawrence & MB McDonald, Page no. 297-300.
	Practical Work Revision of Lab Work	
Week 8	1.15. Seed analysis, sampling, processing, conditioning drying (Continue) 1.15.1. Procedure, equipment and techniques involved in Seed analysis, sampling, processing, and conditioning drying. 1.16. Seed analysis, sampling, processing, conditioning, drying 1.16.1. Procedure, equipment and techniques involved in Seed analysis, sampling, processing, and conditioning drying.	Principles of Seed Production and Technology by Lawrence & MB McDonald, Page no. 297-300.
	Practical Work Revision of Lab Work	
Week 9	**MID TERM EXAM**	
Week 10	1.17. Seed cleaning, grading, treatment 1.17.1. Seed cleaning techniques using air screen cleaners, purity boxes, size and shape, and chemicals used to preserve seed. 1.18. Seed vigor and viability 1.18.1. Definition of seed vigour and viability and their difference.	Principles of Seed Production and Technology by Lawrence & MB McDonald, Page no. 252-264, 124-127
	Practical Work Overview of Practical	

Week 11	1.19. Seeds' similarities and differences 1.19.1. Seeds differ and are similar depending on their size, shape, colour, texture, appearance, etc. 1.20. Seed longevity and storage 1.20.1. Principles of seed storage, factors affecting seed longevity, condition of storage	Seed Production Principles and Practices by MB McDonald & Lawrence, Page no. 118-120
	Practical Work Purity analysis of seed	
Week 12	1.21. Seed certification: Regulations schemes 1.21.1 Seed Classes, seed certification department FSCRD. 1.22. Field Inspection 1.22.1. Provincial and Federal Seed Certification Departments: Their Role and Responsibilities	Principles of Seed Production and Technology by Lawrence & MB McDonald, Page no. 303-307
	Practical Work Seed viability	
Week 13	1.23. Seed distribution 1.23.1. Seed Distribution Institution including Public, federal and provincial institutions and Universities. 1.23.2. Private national and international companies 1.24. Seed Marketing 1.24.1. Marketing Techniques including Newspaper and TV Ads, Posters, Banners, Radio and seminars.	Principles of Seed Production and Technology by Lawrence & MB McDonald, Page no. 380-388
	Practical Work Seed Vigor	
Week 14	1.25. Seed Act 1976 and amendments made after, 1.25.1. Seed Act and laws (Continue) 1.26. Seed act and laws 1.26.1. The Punjab Seed Act 2015.	FSCRD Website
	Practical Work Germination test	

Week 15	1.27. Promotion of seed industry (Continue) 1.27.1. Role of public sector institutions, Government policies for the seed sector 1.28. Promotion of seed industry 1.28.1. Private sector contribution, Role of policymakers	Economic Survey of Pakistan, Internet
	Practical Work Study visits to seed production farms/ processing industry.	
Week 16	1.29. Seed Biotechnology and Seed Development (Continue) 1.29.1. Biotechnology Definition, Seed Developmental Techniques, Seed Biotechnology Techniques, 1.30. Seed Biotechnology and Seed Development. 1.30.1. Seed Production through Plant Breeding.	Internet, web
	Practical Work Revision of Lab Work	
Week 17/18	**FINAL EXAM**	

Textbooks and Reading Material

1. Textbooks.
   In the detailed course outline, one may mention chapters of the textbook with the content topics
2. Suggested Readings
   2.1. Books

1. Ahmad, S.I. 1992. Seed Certification Manual. National Book Foundation, Islamabad.
2. Anonymous. 1992. Proceeding of International Seminar on Seed, Fauji Fertilizer Corporation. Islamabad.
3. Anonymous. 2001. A Dictionary of Seed Technological Terms. Kalyani Publisher, India.
4. Basra, A.S. (Ed). 2006. Handbook of Seed Technology. Haworth Press New York, USA.
5. ISTA. 1996. International rules for seed testing. Proceedings of International Seed Testing Association, Zurich.
6. Khare, D. and M.S. Bhale. 2000. Seed Technology. Sci. Pub., India.
7. McDonald, M.B. 1989. Seed Science and Technology Laboratory Manual. Iowa State University Press / Ames, USA
8. Singh G. 2000. Economics of Seed Production at Farm level. Pak Book Corp. Lahore.

2.2. Journal Articles/ Reports

Note:

1. It is preferable to use the latest available editions of books. Mention the publisher & year of publication.
2. The references/ bibliography may be written using the typing manual of the concerned faculty/subject. Preferably follow the APA 7th Edition publication manual.

Teaching Learning Strategies

1. Online Classes
2. Recorded Lectures.
3. WhatsApp Group for Discussion
4. Email
5. Text Messages / Phone Calls
6. Reference E-Books

Assignments: Type s and Number with Calendar

1. Seed structures of monocots and dicots
2. FSCR&D organogram
3. Provincial Seed Councils

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Continuous assessment includes Classroom participation, assignments, presentations, viva voce, attitude and behaviour, hands-on activities, short tests, projects, practicals, reflections, readings, quizzes, etc.
3.	Final Assessment	40%	There is a Written Examination at the end of the semester. It is mainly in the form of a test, but owing to the nature of the course, the teacher may assess their students based on term papers, research proposal development, fieldwork, report writing, etc.