

**SEMESTER 1<sup>st</sup>**  
**MINOR COURSE**

**SET122N SEED TECHNOLOGY (SEED SCIENCE AND TECHNOLOGY)**

**CREDITS: THEORY: 04; PRACTICALS: 02**

*Objectives-To provide insights into fundamentals of seed biology, ecology and underlying physiological processes in relation to promising seed industry.*

**Unit I**

Seed Technology - Concept and Objective: Concept of Seed and Grain. Types of seed. Role of Seed Technology. Scope of seed technology in employment generation. Seed Industry scenario in India. Overview of seed industry in Jammu and Kashmir. Seed industry & global market.

**UNIT II**

Floral structure in relation to seed development, Microsporogenesis and Megasporeogenesis. Gametogenesis: structure and development of male and female gametophyte. Pollination- Types and mechanism, Self-incompatibility and male sterility. Agencies for pollination. Seed Development, Seed coat structure and development. External and internal features of monocot and dicot seeds. Seed Dispersal.

**UNIT III**

Seed germination; Types of seed germination (epigeal and hypogeal). Physiological process during seed germination. Factors affecting germination. Seed respiration and breakdown of stored reserves in seed. Seed dormancy- types, significance, mechanism (endogenous and exogenous). Factors regulating seed dormancy, Methods of breaking dormancy. Genetic control of seed dormancy. Role of phytochrome and PGRs.

**UNIT IV**

Seed viability, causes for loss of seed viability. Seed vigour - importance and underlying genetic mechanism. Physiological basis of seed vigour. Seed ageing, physiology of seed deterioration; lipid peroxidation and other seed viability theories in relation to crop performance and yield.

**PRACTICALS:**

1. Study of floral biology of monocots and dicots.
2. Heterostyly, Micro and megaspore structure.
3. Pollen germination and pollen sterility
4. Different germination tests (Paper towel and petridish method)
5. Methods of Breaking seed dormancy
6. Vigour Tests (Brick gravel, Paper piercing, Accelerated Aging and Vigour index)
7. Seed viability Tests.
8. Industrial tour.

**SUGGESTED READINGS**

- Bhojwani, S.S. and Bhatnagar, S.P.2000. The Embryology of Angiosperms (4th revised and enlarged edition). Vikas Publishing House, New Delhi.
- Black M, Bewley D & Halmer P. 2006. The Encyclopedia of Seeds: Science, Technology and Uses; CABI.
- Chhabra AK. 2006. Practical Manual of Floral Biology of Crop Plants. Deptt. of Plant Breeding, CCS HAU, Hisar.
- Agrawal, P.K. & M. Dadlani, 1995. Techniques In Seed Science And Technology (2nd Ed.) South Asian Publ. New Delhi.
- Agrawal, R.L. 1997. Seed Technology (IInd Ed.) Oxford & IBH Publ. Co. Daryaganj, NewDelhi.
- Bench ALR & Sanchez RA. 2004. Handbook of Seed Physiology. Food Product Press.
- Bewley JD & Black M. 1982. Physiology and Biochemistry of Seeds in Relation to Germination. Vols. I, II. Springer Verlag.