

## GPBR 211 - PRINCIPLES OF PLANT BREEDING (2+1)

### Theory

Classification of plants, Botanical description, Floral biology, Emasculation and Pollination techniques in cereals, millets, pulses, oil seeds, fibers, plantation crops etc. Aims and objectives of Plant Breeding; Modes of reproduction, Sexual, Asexual, Apomixis and their classification, significance in plant breeding. Modes of pollination, genetic consequences, differences between self and cross-pollinated crops. Methods of breeding – introduction and acclimatization. Selection . Mass selection Johannson's pure line theory, genetic basis, pure line selection. Hybridization – Aims and objectives, types of hybridization. Methods of handling of segregating generations – pedigree method, bulk method, back cross method and various modified methods. Incompatibility and male sterility and their utilization in crop improvement. Heterosis, inbreeding depression, various theories of Heterosis, exploitation of hybrid vigour-development of inbred lines, single cross and double cross hybrids. Population improvement programmes, recurrent selection, synthetics and composites. Methods of breeding for vegetatively propagated crops. Clonal selection. Mutation breeding – Ploidy breeding. Wide hybridization, significance in crop improvement.

### References

- Allard, R.W. 1960. *Principles of Plant Breeding*. John Wiley and Sons, New York.
- Phundan Singh, 2006. *Essentials of Plant Breeding* . Kalyani Publishers, New Delhi.
- Poehlman, J.M. and Borthakur, D. 1995. *Breeding Asian Field Crops*. Oxford and IBH Publishing Co., New Delhi.
- Sharma, J.R. 1994. *Principles and Practice of Plant Breeding*. Tata McGraw Hill, Publishing Company Ltd., New Delhi.
- Singh, B.D. 2006. *Plant Breeding: Principles and Methods*. Kalyani Publishers, New Delhi.