Plants breeding (Specialization Landscape design, IIIrd Year of study, Vth Semester)

Credit value (ECTS): 4

Course category: mandatory

Course holder:
Assoc. Prof. PhD Elena Liliana CHELARIU

Discipline objectives (course and practical works)

- knowing and adequate utilisation of terms regarding plants' breeding;
- knowing of genetic variability and breeding aims for main floral and dendrology species;
- knowing on initial utilised material in ornamental plants' breeding;
- achievement of knowledge regarding creation methods fort variability and selection of forma at ornamental plants;
- understanding of organizational stages of a breeding process;
- knowledge of some methods and working methods specific for ornamental plants' breeding.

Contents (syllabus)

Course (chapters/subchapters)
1. Genetic basis of plant breeding
1.1. Genetics – science of heredity and variability.
1.2. Cell and heredity.
1.3. Transmission and segregation of characters.
1.4. Linkage and crossing-over.
1.5. Andro-sterility and its utilisation in hybrids' obtain at ornamental plants.
1.6. Mutations and their importance in ornamental plants breeding.
1.7. Elements of population genetics.
2. Fundamentals of plant breeding
2.1. Biological basis of plants' breeding.
2.2. Aims of plants' breeding.
2.3. Initial utilised material in process of plants' breeding.
3. Methods for plants' breeding: selection, hybridization, consanguinity, hetaerists, muta-genesis, variation of chromosome number.
4. Breeding of ornamental plants
4.1. Breeding of floral species cultivated in field (*Chrysanthemum, Gladiolus, Narcissus, Petunia, Tulipa, Zinnia, Viola*) and in protected spaces (*Alstroemeria, Anthurium, Begonia, Chrysanthemum, Dianthus, Freesia, Gerbera, Lilium*, orchids, *Pelargonium, Rosa, Spathypyllum, Zantedeschia)*.
4.2. Breeding of dendrology species (*Acer, Abies, Hydrangea, Juniperus, Lonicera, Picia, Rosa, Syringa*).

Practical works
Recognition of cellular components with role in heredity.
Techniques for chromosome highlighting. Miotic division at ornamental plants.
Meiotic division.
Stages in organising the breeding field for floral plants.
Stages in organising the breeding field for dendrology plants.
Criteria in choosing of genitors.
Stages of hybridization during breeding process. Hybridization techniques.
Examination of viability and pollen germination.

Effectuation of conducted pollination.
Culture technique *in vitro* of vegetal cells and tissues.
Notions of experimental technique.

Bibliography

Callaway D.J., Callaway M.B., 2000 – *Breeding ornamental plants*. cabdirect.org

Munteanu N., 2000 – *Ameliorarea plantelor ornamentale*, Editura "Ion Ionescu de la Brad", Iaşi.

Munteanu N., Fălticeanu Marcela, 2008 – *Genetica şi ameliorarea plantelor ornamentale*, Editura "Ion Ionescu de la Brad", Iaşi.

Savati M., Nedelea G., Ardelean M., 2004 – *Tratat de ameliorarea plantelor*, Editura Marineasa, Timişoara.

Sărac I., 2005 – *Genetica şi ameliorarea speciilor forestiere*, Editura Mirton, Timişoara.

Sestraş R., 2004 – *Ameliorarea speciilor horticole*, Editura AcademicPres, Cluj-Napoca.

Schlegel R., 2009 – *Dictionary of Plant Breeding. Second edition*, CRC Press, Taylor&Francis Gr., UK

Şofletea N., 2005 – *Genetica şi ameliorarea arborilor*, Editura Pentru Viaţă, Braşov.

Tychonievich J., 2013 – *Plant Breeding for the Home Gardener: How to Create Unique Vegetables and Flowers*, Timber Press, USA.

Evaluation

Evaluation form	Evaluation Methods	Percentage of the final grade
Course	Written colloquium	**70 %**
	Monitoring of attendance	**10 %**
Practical works	Tests during semester	**20 %**

Contact

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