

General Genetics (II-nd Year of study, IV-th SEMESTER)

Credit value (ECTS) 3

Course category

Fundamental discipline (optional)

Course holder:

PhD Lecturer Lucian CRETU

Discipline objectives (course and practical works)

- appropriation of the mainly cytogenetics, classic and molecular genetics;
- knowledge of the heredity laws and principles used in different crossing programs and for seed production;
- illustration of the molecular mechanism of heredity substratum;
- properly usage of physical, chemical and biological mutagen agents for organism's variability creation;
- utilization of the recombinant DNA technology and genetic engineering for genetic material handling to obtain new organisms or new products for agriculture, medicine, environment protection.

Contents (syllabus)

Course content
1. Genetics-study object
2. Cellular bases of heredity
3. Molecular bases of heredity
4. Mendelian laws of heredity
5. Chromosome theory of heredity
6. Genetic determinism of the sexes
7. Extra nuclear heredity
8. Genetic mutations

Applied works content
Pre-treatment and hypotonic treatment. Microscopy
Mitosis
Meiosis
Study of plant chromosomes
Heterochromatic patterns identification techniques
Sporogenesis and gametogenesis – pollen germination; fecundation (<i>Zea mays</i> , <i>Vicia faba</i>)
Polyploidy (producing and determination methods) – direct methods to determine the polyploidy degree at the genus <i>Triticum</i> ; doubling the chromosomes by means of meristem culture on a medium supplemented with colchicine; chloroplasts number determination in stomata protecting cells; numbering methods of stomata in plant epidermis cells
Mutagenesis – abnormalities in chromosome structure (deletions, duplications, inversions, translocations)

Bibliography

1. **Țârdea, Gh., 2002** – Plant Genetics, Editura “Ion Ionescu de la Brad”, Iași
2. **Țârdea, Gh., Leonte, C., 2002** – Vegetal cytogenetics, Editura “Ion Ionescu de la Brad”, Iași
3. **Crăciun, T. și colab., 1978** - Genetics, Editura Didactică și Pedagogică, București
4. **Crăciun, T., 1981** - Genetics of horticultural plants, Editura Ceres, București.
5. **Raicu, P., 1980** - Genetics, Editura Didactică și Pedagogică, București
6. **Raicu, P., 1997** - General and human genetics, Editura Humanitas
7. **Antoși, St., Gavrilă, L., 1981** - Advances in molecular genetics, Editura științifică și enciclopedică, București
8. **Țârdea, Gh., Crețu, L., 1998** - Genetics, practical work, U.S.A.M.V. Iași

Evaluation

Evaluation form	Evaluation Methods	Percentage of the final grade
Exam	Oral and writing examination	50%
Appreciation of the activity during the semester	Oral assessment during the semester, verification tests and final laboratory colloquium.	50%

Contact

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