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

**Credit value (ECTS) 3**

**Course category**

Fundamental discipline (optional)

**Discipline Code:** A.EMIAIA.F.215

**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)**

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| **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 |

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| **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 (*Zea mays*, *Vicia faba*) |
| Polyploidy (producing and determination methods) – direct methods to determine the polyploidy degree at the genus *Triticum*; 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. **Ţîrdea, Gh., 2002** – Plant Genetics, Editura “Ion Ionescu de la Brad”, Iaşi
2. **Ţîrdea, Gh., Leonte, C., 2002** – Vegetal cytogenetics, Editura “Ion Ionescu de la Brad”, Iaşi
3. **Crăciun, T. şi colab., 1978** - Genetics, Editura Didactică şi Pedagogică, Bucureşti
4. **Crăciun, T., 1981** - Genetics of horticultural plants, Editura Ceres, Bucureşti.
5. **Raicu, P., 1980** - Genetics, Editura Didactică şi Pedagogică, Bucureşti
6. **Raicu, P., 1997** - General and human genetics, Editura Humanitas
7. **Antohi, St., Gavrilă, L., 1981** - Advances in molecular genetics, Editura ştiinţifică şi enciclopedică, Bucureşti
8. **Ţîrdea, Gh., Creţu, L., 1998** - Genetics, practical work, U.S.A.M.V. Iaşi

**Evaluation**

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| **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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