**Land reclamation (II Year of study, IV SEMESTER)**

**Credit value (ECTS) 4**

**Course category**

Domain (Compulsory courses)

**Discipline Code:** A.EMIAIA.D.211

**Course holder:**

**PhD. Prof. Daniel BUCUR**

**Discipline objectives (course and practical works)**

The aim of the course is to provide students with the knowledge and skills necessary for water management in agriculture and the rational use of land resources. The course also explores methods for protecting and improving land affected by soil erosion and landslides. Traditional technical options for water storage and flood protection are analyzed from both a technical and economic perspective. General concepts of hydraulics and hydrology are introduced to help students understand issues specific to land reclamation works.

During practical sessions, students will learn how to design land use categories for agricultural purposes, as well as local irrigation systems, drainage systems, and measures for soil erosion control.

**Contents (syllabus)**

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| **Course (chapters/subchapters)** |
| **Introduction:** An overview of the importance of land reclamation in sustainable agriculture, highlighting its role in optimizing water and soil resources amidst modern challenges such as soil degradation, water scarcity, and climate change. |
| **Hydraulics Concepts**: Basics of hydrostatics; basics of hydrodynamics; applications of hydraulics in land improvement works. |
| **Hydrology, Hydrography, and Hydrometry Concepts**: The water cycle in nature; hydrographic networks; surface water hydrometry. |
| **Hydrogeology Concepts**: Classification and distribution of groundwater; the regime and hydrometry of phreatic waters in lands equipped with irrigation and drainage works. |
| **Irrigation Systems**: Water intakes for irrigation; irrigation systems with earth channels; systems with buried pipelines; automation of irrigation systems; irrigation methods; operation and maintenance of irrigation systems. |
| **Agricultural Land Drainage**: Excess moisture on agricultural land; design and sizing of the channel network; execution of drainage networks. |
| **Subsurface Drainage**: Materials used in drainage construction; horizontal drainage; mole drainage; vertical drainage; operation and maintenance of drainage works. |
| **Soil Erosion Control**: Determining and favoring factors of soil erosion; consequences of soil erosion; quantitative estimation of soil losses; simple anti-erosion works; agro-phytotechnical works and hydrotechnical works for controlling the erosion process. |
| **Landslides**: Causes and classification of landslides; prevention and control of landslides; rehabilitation of degraded agricultural lands affected by landslides. |

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| **Practical works** |
| Sizing of channels and pipelines |
| Processing of meteorological and hydrological data |
| Determination of irrigation scheduling parameters |
| Layout and sizing of the irrigation network |
| Preparation of longitudinal and cross-sectional leveling profiles for an irrigation channel |
| Calculation of earthworks (volumes of soil to be moved). |
| Calculation of earthworks for for the construction of an irrigation channel |
| Sizing of a pumping station |
| Layout and sizing of the horizontal drainage network |
| Quantitative estimates of soil losses on agricultural land |
| Sizing of terraces |
| Sizing of contour channels and discharge channels |
| Calculation of transverse works for gully erosion forms |
| Final colloquium to verify knowledge |

**References**

1. Bucur D. ed**.**, 2016 - *River basin management*, InTech, Rijeka, ISBN 978-953-51-2604-1, DOI: 10.5772/61557, 316 pages, - <http://dx.doi.org/10.5772/61557>.
2. Savu P., Bucur D., 2002 - Organization and Land Reclamation of Agricultural Territory with Land Improvement Works (*in Romanian*), “Ion Ionescu de la Brad” Publishing House, Iaşi.
3. Savu P., Bucur D., Jităreanu S. I., 2005 - Land Reclamation and Crop Irrigation - Practical Works (*in Romanian*), “Ion Ionescu de la Brad” Publishing House, Iaşi.

**Evaluation**

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| **Evaluation form** | **Evaluation Methods** | **Percentage of the final grade** |
| Exam | Oral examination | 60% |
| Appreciation of the activity during the semester | Oral assessment during the semester, verification tests and final laboratory colloquium. | 40% |

**Contact**

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