

Iasi University of Life Sciences  
 Faculty of Agriculture  
**Master studies - Soil and water conservation**  
 (Ind Year of study, Ird Semester)  
 Credit value (ECTS) 9  
 Course holder: Prof. PhD. Costică AILINCAI

Discipline “*Soil and water conservation*”, according to the course syllabus, focuses on:

Knowledge of the characteristics and basic notions specific to the different methods for the sustainable conservation of soil and water quality and those regarding the activities of sustainable rural development.

Knowledge and use of agrochemical studies and those for the organization of the territory and crop rotations;

Acquiring the necessary skills for the analysis, evaluation and establishment of the best agricultural systems for different agricultural areas;

Acquiring the knowledge and skills necessary to determine the physical and chemical properties of soil and water;

Accumulation of information necessary for the evaluation and development of conservative agricultural technologies.

**Contents (syllabus)**

Content of the discipline (analytical program)

Course (chapters / subchapters)
1. The evolution of soil fertility in different agricultural systems 1.1. Soil fertility assessed by physical and chemical indicators; 1.2. Agrochemical mapping of soils, analysis and interpretation of agrochemical indices and preparation of fertilization plans; 1.3. Physical and chemical properties that limit soil fertility; 1.4. Agricultural systems; 1.4.1. Conventional agriculture system; 1.4.2. Sustainable agriculture; 1.4.3. Precision agriculture.
2. Modern technologies for improving soil fertility 2.1. The purpose and importance of the information system for recording, storing and processing data obtained by soil mapping; 2.2. The impact of some technological elements in the management of soil fertility - crop rotations, soil works, fertilization and soil amendment systems; 2.3. Technologies for the use of organic fertilizer resources; 2.4. Conservation tillage technologies; 2.5. Advanced technologies in agriculture.
3. Agricultural and environmental strategies in the EU and in the world 3.1. Common Agricultural Policy (CAP) measures on sustainable land management and rural development; 3.2. Sources of ecosystem pollution and protection measures; 3.2.1. Nitrates as a pollutant in water and food; 3.2.2. Sources of soil degradation and water pollution; 3.3. Indicators for assessing the progress and effectiveness of the Common Agricultural Policy; 3.4. CAP legislation on agriculture, rural development and environmental protection in the EU; 3.5. Regulations of the Water Framework Directives Directives 91/414 / EC, 98/8 / EC and 2000/60 / EC, Nitrates Directive (91/676 / EEC), Directive 2009/90 / EC on the monitoring of the chemical status of waters, 2006 / 11 / EC on pollution of the aquatic environment etc. and the state of water bodies in the Member States presented by the Water Information System for Europe (WISE) and the European Environment Agency (EEA); 3.6. The impact of human activities on soil and water quality and their management plans in different hidrografic basin. Directive (EU) 2020/2184 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2020 on the quality of water intended for human consumption. European Commission (2021), <i>EU Action Plan: ‘Towards Zero Pollution for Air, Water and Soil’ - Pathway to a Healthy Planet for All</i> , COM (2021) 400 final.

## Content of the discipline (analytical program)

Practical works
1. Use and capitalization of pedological and agrochemical studies to identify different forms of degradation of agricultural land
2. Determination of some physical, hydrophysical and chemical properties of the soil - soil structure, CC = field capacity, CU = available water capacity, CT = total capacity, CD = draining capacity, nitrate content etc.
3. Monitoring the ecological and chemical state of water - oxygen content; pH value; electrical conductivity; the content of salts and nitrates etc.
4. Elaboration and organization of the cropping systems and the crops rotation for soil and water protection
5. Elaboration of fertilization plans at different crop rotations that ensure soil and water protection
6. Establishing the system of conservative tillage, within the crop rotation, which determines the protection of the soil
7. Establishment of technical elements for agrotechnical works (fertilization, calcium amendment, decompaction, etc.) on degraded lands

### References

1. Gerard Jitoreanu, Costică Ailincăi, Simion Alda, Ileana Bogdan, Costică Ciontu, Dan Manea, Aurelian Penescu, Mihai Rurac, Teodor Rusu, Denis Țopa, Paula Ioana Moraru, Adrian Ioan Pop, Marian Dobre, Anca-Elena Calistru - 2020 -Tratat de Agrotehnică, Editura “Ion Ionescu de la Brad”, Iași, 1240 pagini, (p. 1219-1233), ISBN 978-973-147-353-6.
2. Ailincăi C., 2016 – *Mijloace agrotehnice pentru creșterea producției și ameliorarea fertilității solului*, Edit. “Ion Ionescu de la Brad”, Iași, 2015, ISBN 978-973-147-216-4.
3. Ailincăi Costică, Jitoreanu Gerard, Lucian Raus, Țopa Denis- 2013-*Tehnologii de cultură și metode de protecție a solului - Crop technologies and methods for soil protection*, Editura “Ion Ionescu de la Brad”, Iași, 2013, 212 p, ISBN 978-973-147-121-1.
4. Directive COM (2006) 232– CEC, 2002, COM (2002); Towards a Thematic Strategy for Soil Protection.
5. COM (2021) 699 final - EU Soil Strategy for 2030. The benefits of health soils for people, food, nature and climate. COM (2021) 699 final - Strategia UE pentru sol pentru 2030, Beneficiile solurilor sănătoase pentru oameni, hrană, natură și climă.
6. European Commission (2020), *A Farm to Fork Strategy for a fair, healthy and environmentally-friendly food system*, COM (2020) 381 final.
7. European Commission (2021), EU Action Plan: ‘Towards Zero Pollution for Air, Water and Soil’ - Pathway to a Healthy Planet for All, COM (2021) 400 final.
8. Legea nr. 246/ 2020 privind utilizarea, conservarea și protecția solului.
9. Directive (EU) 2020/2184 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2020 on the quality of water intended for human consumption.

### Evaluation

Evaluation form	Evaluation Methods	Percentage of the final grade
Final Exam	Oral examination	50%
Labs Colloquium	Oral examination	10%
Partial exam	Written assessment	30%
Evaluation during the semester	Oral examination	10%

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Prof. Costică AILINCĂI, Phd.

E-mail: ailincai@uaiasi.ro

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