



Number. _____ from _____

Form UASVM -CN- 0107020222

SUBJECT OUTLINE**1. Information on the programme**

1.1. Higher education institution	University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca
1.2. Faculty	Agriculture
1.3. Department	Environmental and plant protection
1.4. Field of study	Environmental and plant protection
1.5. Cycle Education ¹⁾	Bachelor
1.6. Specialization / Study program	Environmental Engineering
1.7. Form of education	IF

2. Information on the discipline

2.1. Name of the discipline	FITTINGS AND HYDROTECHNICAL CONSTRUCTIONS							
2.2. Holder of course activities	Professor Marcel Dirja Ph.D							
2.3. Holder of seminar / laboratory activities / project	Lecturer Cristian Mălinaș Ph.D							
2.4. Year of study	I	2.5. Semester	I	2.6. Evaluation type	Continue	2.7. Discipline status	Content ²⁾	DD
							Compulsoriness ³⁾	DO

3. Total estimated time (teaching hours per semester)

3.1. Number of hours per week - frequency form	4	Out of which: 3.2. lecture	2	3.3. seminar / laboratory / project	2
3.4. Total hours of the educational plan	40	Out of which: 3.5. lecture	20	3.6. seminar / laboratory	20
Distribution of the time fund					hours
3.4.1. Study after manual, lecture support, bibliography and notes					10
3.4.2. Additional documentation in the library, on specialized electronic platforms and in the field					10
3.4.3. Preparation of seminars / laboratories / projects, topics, reports, portfolios and essays					10
3.4.4. Tutorials					4
3.4.5. Examinations					4
3.4.6. Other activities					
3.7. Total hours of individual study	38				
3.8. Total hours per semester	78				
3.9. Number of credits ⁴⁾	3				

4. Preconditions (where applicable)

4.1. of curriculum	Mathematics, physics, topography, pedology, hydrology, agricultural and horticultural systems
4.2. of skills	The student must have basic knowledge of hydraulics and computer-aided design

5. Conditions (if applicable)

5.1. for the course	The course is interactive, students can ask questions about the content of the exhibition. The university discipline requires the observance of the start and end time of the course. No other activities are tolerated during the lecture, mobile phones should be closed.
5.2. for the seminar / laboratory / project	In practical works it is compulsory to consult the practical work tutor, each student will carry out an individual activity with the laboratory materials made available and described in the practical work tutor. Academic discipline is required throughout the duration of the work.

6. Cumulated specific competences

Professional skills	Field application of urbanism projects and spatial planning, civil and industrial constructions, communication paths and art works, hydrotechnical constructions and land improvements etc. Determination of displacements and deformations of constructions and land. Performing specific topographic surveys necessary to develop topographic and thematic plans and maps.
Transversal Competences	Orientation of students in the field of designing land improvement works. Training as specialists in tracing the works for the execution of land improvement arrangements. Initiation of specialists in the problems of inventory and record of the hydrotechnical arrangements.

7. Discipline objectives (based on the grid of specific skills accumulated)

7.1. General objective of the discipline	Acquiring theoretical and practical knowledge on modeling, and simulating transfer processes specific to natural and anthropic systems. Acquiring theoretical and practical knowledge regarding the optimization of transfer processes of pollutants specific to natural and anthropic systems.
7.2. Specific objectives	Modeling specific environmental processes specific to natural and anthropic systems, analytical and experimental models. Process optimization techniques and their applications in environmental engineering.

8. Contents

8.1. Course Number of hours - 128	Teaching methods	Remarks
1. Introduction and basics. The purpose, purpose and importance of the discipline. Development. Liaison with other disciplines. Hydraulic problems. Hydrostatic. The fundamental law of hydrostatics. The fundamental equation of hydrostatics in general form. Applications of the fundamental equation of hydrostatics. Hydrodynamics. Notions about fluid movement. Classification of fluid movement. Fundamental equations of hydrodynamics. Determination of flows on channels and natural watercourses of channels (pipes). Determination of the flow on channels and pipes. Speed distribution in open channels and pipes. Determine the flow by reducing the local drainage section. Weirs. Constructions used as water meters. Floodgates. Mobile siphons. Sizing of channels and pipes. Calculation of flow rates under pressure pipes. Sizing the pipes used in improvement works.	Video support - Interactive discussions improvement.	2 lectures
2. Notions of hydrology, hydrography and hydrogeology. The water circuit in nature. Rainfall. Rainfall indices and rainfall characteristics. Infiltration. Factors that influence infiltration. Evapotranspiration. Spill. Factors influencing leakage. Establishing the flow parameters. The river basin. The hydrographic network. Hydrometer. Distribution of groundwater in the earth's crust. Groundwater circulation. Notions about ground water.	Video support - Interactive discussions improvement.	2 lectures
3. Soil erosion. Surface erosion. Depth erosion. Phases of soil erosion. Methods for determining the average specific erosion. Anti-erosion works. Direct methods for quantifying soil erosion. Factors influencing soil erosion.	Video support - Interactive discussions improvement.	2 lectures
4. Transversal work needed to stabilize a ravine or oyster. Hydraulic sizing of a fall. Types of transversal works. Determination of the number and the corresponding distance between the transversal works on the thread of a ravine.	Video support - Interactive discussions improvement.	2 lectures

Bibliography Required:

1. **DÎRJA M., BUDIU V.,** *Îmbunătățiri funciare – Combaterea excesului de umiditate pe terenurile agricole*, Ed. AcademicPres, Cluj-Napoca, 2006
2. **DÎRJA M.,** *Îmbunătățiri funciare – Complexul de măsuri și lucrări pentru combaterea eroziunii solului*, Ed. MEDIAMIRA, Cluj-Napoca, 2006
3. **DÎRJA M.,** *Combaterea eroziunii solului*, Ed. Risoprint, Bibliografie: Cluj-Napoca, 2000

Optional bibliography:

1. **IMURESAN I., PLEȘA I., ONU N., SAVU P., NAGY Z., JINGA I., TEODOROIU AI.,**
2. **PĂLTINEANU I., TOMA I., VASILESCU I.,** *Irigații, desecări și combaterea eroziunii solului*, Ed.
3. *Didactică și Pedagogică București, 1992*
3. **LUCA E., V. BUDIU, Ana CIOTLĂUȘ, Adela HOBLE,** *Exploatarea sistemelor de îmbunătățiri funciare, Ediția a II-a, Irigații – Lucrări practice*, Ed. Risoprint, 2013.

9. Corroborating the contents of the discipline with the expectations of representatives of epistemic communities, professional associations and representative employers in the field related to the program

The content of the discipline corresponds to the approach of these subjects in the Romanian school, the arrangement of the territory with works of the land improvements representing the field of land improvement science that has as its object the theoretical study and the practical application of the assembly of hydrotechnical, agrotechnical, chemical and biological processes. complex measures, works and technical interventions in order to stabilize and improve the pedological, hydrological and climatic conditions, etc., in order to capitalize on non-productive land for agricultural use or to improve the conditions of development of agricultural crops on some poorly productive lands.

10. Evaluation

Activity type	10.1. Evaluation criterias	10.2. Methods of evaluation	10.3. Weight in the final grade
10.4. Course	- Knowledge of the most important constructions and arrangements of FI; - Execution of certain skills of tracing the works of FI.	Tests	60%
10.5. Practical Works	The students will have to solve individually different applications, calculation notes specific to the project preparation, from which they will deduce their knowledge acquired at the hours of practical work.	Teaching and project support	40%
10.6. Minimum standard of performance			
Mastery of scientific information transmitted through lectures and practical papers at an acceptable level. Obtaining the passing grade for the ongoing checks is a condition of promotability.			

¹ The study cycle - one of the variants is chosen - Bachelor / Master / Doctorate

² The regime of the discipline (content) - for the license level one of the variants is chosen - DF (fundamental discipline), DD (discipline in the field), DS (specialized discipline), DC (complementary discipline).

³ The regime of the discipline (compulsory) - one of the variants is chosen - DI (compulsory discipline) DO (optional discipline) DFac (optional discipline).

⁴ A credit is equivalent to 25-30 hours of study (teaching activities and individual study)

Date completed
04.09.2019

Course holder
Prof. Marcel Dirja PhD.

Holder of laboratory works / seminars
Lect. Mălinaș Cristian PhD.

Date of approval department
in the department
05.09.2019

Department Director
Professor. Ioan Oroian PhD