UNIVERSITATEA DE ȘTIINȚE AGRICOLE ȘI MEDICINĂ VETERINARĂ CLUJ-NAPOCA
Facultatea de Horticultură
Calea Mănăștur 3-5, 400372, Cluj-Napoca, România
Tel: 0264-596.384, Fax: 0264-593.792

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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			ANALYTICAL AND DIFFERENTIAL GEOMETRY						
2.2. Holder of course activities				Professor.Ioana Pop Ph.D.					
2.3. Holder of seminar / laboratory activities / project				Lecturer Cristian Mălinaș Ph.D					
2.4. Year of study	II	2.5. Semester	II	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	3	Out of which: 3.2. lecture	2	3.3. seminar / laboratory / project	1
3.4. Total hours of the educational plan	42	Out of which: 3.5. lecture	28	3.6. seminar / laboratory	14

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	8
3.4.3. Preparation of seminars / laboratories / projects, topics, reports, portfolios and essays	10
3.4.4. Tutorials	2
3.4.5. Examinations	3
3.4.6. Other activities	

3.7. Total hours of individual study	33
3.8. Total hours per semester	75
3.9. Number of credits[4]	3

4. Preconditions (where applicable)

4.1. of curriculum	-
4.2. of skills	team communication skills, organization, use of the internet as a resource.

5. Conditions (if applicable)

5.1. for the course	Room equipped with computer, video projector, blackboard, internet access. Academic discipline is required throughout the duration of the lecture. No other activities are tolerated during the lecture, mobile phones must be closed.
5.2. for the seminar / laboratory / project	Room equipped with computer, video projector, blackboard. Academic discipline is imposed throughout the duration of the work.

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6. Cumulated specific competences

Professional skills	**1. Knowledge, understanding, explanation and interpretation.** Acquisition by students of mathematical methods that have applications in mechanics and environmental engineering. Development of students' logical thinking. Educating students in the spirit of more realistic approaches to problems in mechanics, environmental engineering. Use of mathematical tools in an interdisciplinary context. Design of mathematical models for describing characteristic environmental phenomena. **2. Instrumental applicative** – the acquisition by the students of the applied instrumental methods: explanation, debate, case study, problematization, simulation of situations, working methods in group and individual, methods of thinking development and study of bibliography. **3. Attitude** - manifesting positive and responsible attitudes towards the mathematical field that helps investigating economic or engineering problems in the environment field.
Transversal Competences	To understand the connections between the specialized factors, mathematics and the phenomena that are suitable for modeling. To develop the skills to work effectively with people with different personalities and backgrounds. To have competences for analyzing the utility of different analytical and differential geometry

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

7.1. General objective of the discipline	Development of logical thinking with the help of geometric reasoning as well formation of the computational skills needed in mathematical modeling of phenomena: calculation of lengths, areas and volumes; issues related to positions of some straight lines or other straight lines, etc.
7.2. Specific objectives	Acquiring the basics presented throughout the semester. Ability to apply the techniques and methods presented at the course and at the seminar.

8. Contents

8.1. Course Number of hours - 28	Teaching methods	Remarks
1. Vector spaces. Generator system. Changes of bases in a vector space. Vector subspaces	Lecture	2 lectures
2. Linear applications. Isomorphisms of vector spaces The core and image of a linear application.	Lecture	2 lectures
3. Free vectors.Colininarity and coplanarity Products in the free vector space	Lecture	4 lectures
4. Line in plane and conical. The circle, ellipse, parable. Conical on the general equation	Lecture	4 lectures
5. Plane and line in space. Coordinate systems in space. The plane. Line in space. Sphere	Lecture	4 lectures
6. Quadrics. Generation of surfaces. Curves in plane Tangent and normal to a flat curve. The bend of a plane curve	Lecture	4 lectures
7. Curves in space. Tangent and normal plane to a curve in space. The osculating plane. Frenet's trihedral. Curvature and the torsion of a curve in space. Frenet's formulas	Lecture	4 lectures
8. Surfaces. The plane tangent and normal to a surface Asymptotic lines of a surface	Lecture	2 lectures
9. The normal curvature of a curve located on a surface. Main curves. Total curvature and average curvature. Curve lines and geodesic lines	Lecture	2 lectures

		Holder of laboratory works /
Date completed	Course holder	seminars
05.09.2019	Professor Ioana Pop PhD.	Lecturer Mălinaș Cristian PhD.

Date of approval department
in the department
05.09.2019

Department Director
Professor. Ioan Oroian PhD