UNIVERSITATEA DE ŞTIINŢE AGRICOLE ŞI MEDICINĂ VETERINARĂ CLUJ-NAPOCA
Facultatea de Horticultură
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Number._____from ___   **Form UASVM -CN- 0107020222**

SUBJECT OUTLINE

I.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		GRAPHIC ASSISTED BY COMPUTER						
2.2. Holder of course activities			Lecturer Cristian Mălinaş Ph.D					
2.3. Holder of seminar / laboratory activities / project			Lecturer Cristian Mălinaş Ph.D					
2.4. Year of study	I	2.5. Semester	II	2.6.Evaluation type	Continue	2.7. Discipline status	Content[2]	DF
							Compulsoriness[3]	DO

3. Total estimated time (teaching hours per semester)

3.1. Number of hours per week - frequency form	2	Out of which: 3.2. lecture	1	3.3. seminar / laboratory / project	1
3.4. Total hours of the educational plan	28	Out of which: 3.5. lecture	14	3.6. seminar / laboratory	14

Distribution of the time fund	hours
3.4.1. Study after manual, lecture support, bibliography and notes	16
3.4.2. Additional documentation in the library, on specialized electronic platforms and in the field	16
3.4.3. Preparation of seminars / laboratories / projects, topics, reports, portfolios and essays	10
3.4.4. Tutorials	10
3.4.5. Examinations	10
3.4.6. Other activities	

3.7. Total hours of individual study	62
3.8. Total hours per semester	90
3.9. Number of credits[4]	3

4. Preconditions (where applicable)

4.1. of curriculum	Computer programming
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 IT technology, sheet metal. Academic discipline is required throughout the duration of the lecture. No other activities are tolerated during the lecture, mobile phones must be switched off.
5.2. for the seminar / laboratory / project	Room equipped with computers. Academic discipline is required throughout the duration of the work.

6. Cumulated specific competences

Professional skills	1. Knowledge, understanding, explanation and interpretation. Acquisition by students of the theoretical bases of the realization of computer-assisted graphical representations. 2. Instrumental-applicative. Use of the specific methodology for computer-aided graphics, respectively of the programs used (CAD) 3. Attitudinal. - cultivation of a scientific environment centered on democratic values and relationships - optimal and creative exploitation of one's potential in scientific activities
Transversal Competences	To understand the connections between the factors of competence with impact on the development of the elements of computer-assisted graphics To develop the skills to work effectively with people with different personalities and backgrounds. To have competences for analyzing the usefulness of the different types of computer-aided graphics creation programs in different contexts.

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

7.1. General objective of the discipline	Presentation of the concepts, principles and notions essential to computer-assisted graphics.
7.2. Specific objectives	Students' acquisition of CAD concepts; Knowledge of the most used programs, in computer-aided design, in the mechanical field and of the main characteristics, of the programs in the CAD category; Knowledge of CAD data transfer methods and transfer file formats; Knowledge of three-dimensional geometric modeling methods; Creating the practical skills needed to operate CAD systems.

8. Contents

8.1. Course Number of hours - 14	Teaching methods	Remarks
1. Getting started. Defining computer-assisted graphics. Overview of the process. Uses (industrial design, engineering design).	Lecture - Exemplification	1 lecture
2. Theoretical basis of computer-assisted graphics. History of computer-assisted graphics. Computational Geometry. Definitions and general aspects.	Lecture - Exemplification	1 lecture
3. The CAD system. Definitions. CAD systems architecture. Advantages of using CAD systems.	Lecture - Exemplification	2 lectures
4. Geometric modeling. Definition of the concept of geometric modeling. The notion of geometric model / CAD model. Geometric models. Defining. Types of geometric modeling.	Lecture - Exemplification	2 lectures
5. Introduction to three-dimensional geometric modeling. Classification of three-dimensional geometric models: Wireframe models, surface models, solid models. Features of 3D models, advantages and disadvantages.	Lecture - Exemplification	2 lectures
6. Classification of geometric modeling methods and techniques. Solid modeling. Introduction. Constructive solid geometry. Defining. Applications of solid constructive geometry.	Lecture - Exemplification	2 lectures
7. Representation through borders. Generation of different types of surfaces: tabular surfaces, rigged surfaces, revolution surfaces, defined surfaces of edges.	Lecture - Exemplification	2 lectures
8. Solid modeling using feature-based models. Parameterized modeling. Graphic building blocks.	Lecture - Exemplification	1 lecture
9. Editing and viewing three-dimensional objects	Lecture - Exemplification	1 lectures

8.2.Practical Work Number of hours – 14	Teaching Methods	Remarks
1. Work instructions and norms of the labor safety technique in the profile laboratories.	Realization of the practical work individually in front of the computer	1 practicals works
2. Introduction to computer-aided design. CAD working session. Coordinate system (WCS and UCS). Absolute and relative Cartesian coordinates, polar coordinates. System of units of measurement (setting the display format and precision for numerical values and angles). Object Snap.	Realization of the practical work individually in front of the computer	2 practicals works
3. The working environment. Setting the limits (Limits). Grid, Snap, Ortho modes. Setting the type of line (Ltype). Scaling applied to line types (Ltscale). Establishing color for entity representation (Color)..	Realization of the practical work individually in front of the computer	2 practicals works
4. Application: obtaining the prototype file, using the layers in the drawing file.	Realization of the practical work individually in front of the computer	2 practicals works
5. Applications: obtaining 2D representations for "prismatic parts", used in environmental technologies: using commands for 2D representation entities.	Realization of the practical work individually in front of the computer	2 practicals works
6. Definition and use of blocks. Association of blocks information (attributes). Application: making the overall drawings using the blocks	Realization of the practical work individually in front of the computer	2 practicals works
7. Verification of knowledge	Testing	1 practicals works

Bibliography Required:
1. Course notes;
2. Nichita Gabriela Georgeta, *Bazele proiectării asistate de calculator*, Îndrumător de lucrări, Oradea, 2006;
   Braduț, M., *AutoCAD-ul în trei timpi, ghidul proiectării profesionale* Ediția a 2 a, revăzuta si adăugită,
   Editura POLIROM,
   Iaşi 2006
3. Opruţa Daniela, M., Gaceu, L., *Grafica asistată de calculator: aplicaţii 2D*, Editura Universităţii Transilvania, Braşov, 2009;
4. Opruţa Daniela, *Proiectarea asistată de calculator*, Vol.1, Editura Dacia, Cluj-Napoca, 2003;
5. Pop Mircea T., *Elemente de teorie şi aplicaţii CAD*, Editura Universităţii din Oradea, 2004;
6. Simion, I., *AutoCAD 2010 pentru ingineri*, Editura Teora, Bucureşti, 2010.

Optional bibliography:
1. Harrington, D. , Burchard, Bill; Pitzer, David Place, *AutoCAD 2002*, Editura Teora, Bucureşti, 2002
2. Nedelcu, D., *Grafică asistată de calculator prin AutoCAD*, Editura Eftimie Murgu, Reşiţa, 2010
3. Simion, I., *AutoCAD 2008 pentru ingineri*, Editura Teora, Bucureşti, 2008;

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 constitutes the natural continuation of the competences acquired in the previous years in order to obtain the competences mentioned above. Also, the content aligns with the trend of universities in the country and abroad, which train specialists in environmental protection as identified and defined by professional associations and employers.

10. Evaluation

Activity type	10.1. Evaluation criterias	10.2. Methods of evaluation	10.3. Weight in the final grade
10.4. Course	-response to the exam - way of presenting the answer -the ability to synthesize	Check in progress	70%
10.5. Seminar / Laboratory	- test results - laboratory presence -active involvement	Performance evaluation at final verification. Questions for students.	30%

10.6. Minimum standard of performance

COURSE: Requirements for note 5 - The student must know the basics: CAD, CAM, CAE, definition of CAD systems, classification of programs in the CAD category, data transfer methods, basics of solid modeling.
LABORATORY: Obtaining minimum marks 5 for all laboratory applications.

Date completed	Course holder	Holder of laboratory works /
05.09.2019	Lect. Mălinaș Cristian PhD.	seminars
		Lect. Mălinaș Cristian PhD.

Date of approval department
in the department
05.09.2019

Department Director
Professor. Ioan Oroian PhD.