SYLLABUS

1. Data about the program of study

1.1	Institution	The Technical University of Cluj-Napoca
1.2	Faculty	Faculty of Civil Engineering
1.3	Department	Railways, Roads and Bridges
1.4	Field of study	Civil Engineering
1.5	Cycle of study	Bachelor of Science
1.6	Program of study/Qualification	C.I.A.C. (in English) / engineer
1.7	Form of education	Full time
1.8	Subject code	3.00

2. Data about the subject

2.1	Subject name			Descriptive Geometry			
2.2	Subject area			Civil Engineering			
2.3	Course responsible/lecturer			Assist. Prof. PhD. Eng. Nerișanu Raluca			
2.4	Teachers in charge of seminars			Assist. Prof. PhD. Eng. Nerișanu Raluca, Assist. PhD Student Eng. Tudoreanu Adrian			
2.5 Year of study	I	2.6 Semester	1	2.7 Assessment	Exam	2.8 Subject category	FD/ID

3. Estimated total time

3.1 Number of hours per week	4	3.2 of which, course:	2	3.3 applications:	2
3.4 Total hours in the curriculum	125	3.5 of which, course:	28	3.6 applications:	28
Individual study					69 hours
Manual, lecture material and notes, bibliography					23
Supplementary study in the library, online and in the field					12
Preparation for seminars/laboratory works, homework, reports, portfolios, essays					28
Tutoring					3
Exams and tests					3
Other activities					-

3.7	Total hours of individual study	69
3.8	Total hours per semester	125
3.9	Number of credit points	5

4. Pre-requisites (where appropriate)

4.1	Curriculum	N/A
4.2	Competence	N/A

5. Requirements (where appropriate)

5.1	For the course	Cluj-Napoca, Observatorului Street No.72-74, Amphitheatre A4.
5.2	For the applications	Cluj-Napoca, Observatorului Street No. 72-74 – Classrooms equipped with drawing tables: O207, O208, O209.

6. Specific competences

Professional competences	Theoretical knowledge (what to know)	• development of space sight seeing ability – generally indispensable for a specialist in technical field, and especially for a specialist in civil engineering field; • acquiring the different representation systems for the elements and geometrical solids, i.e.: 1. The orthogonal projection on two or three planes of projection • fundamental elements about the objects representation: notions about the projections, the orthographic representation on two or three planes of projection of the point, of the straight line, of the plane, of the polyhedrons and of the curved surfaces; 2. The representation in axonometric projection 3. The representation in projection with elevations, with specific reference to the surfaces used in constructions.
	Gained skills	After completing the discipline, the students will be able to: • make the difference between the different representation systems (the double orthogonal projection, the axonometric projection, the projection with elevation); • represent solids and surfaces, based on their way of engendering; • visualize the object or the group of objects in 3D-Representation, based on 2D-Representation, thus developing the space-sight ability; • ”read” different kinds (systems) of representations.
	Acquired skills	After completing the discipline, the students will be able to: • represent graphically, in different representation systems, various types of surfaces used in civil engineering, with the porpose of drafting a specific technical documentation, after the study of technical drawing norms.
Cross competences		• representation of some elements and solids based by the learned rules; • drafting of a portfolio of drawings; • discussing about the applications solutions with the teacher who leads the classes and with the colleageus; disseminate the results.

7. Discipline objectives (as results from the key *competences gained*)

7.1	General objective	Recognition of the elements and structures of civil engineering constructions, specific for the program of study graduated (C1)
7.2	Specific objectives	Assimilating the knowledge of graphic representation and the modelling of different types of surfaces specific for civil engineering field, in order to draw up a particular technical documentation.

8. Contents

8.1. Lecture (syllabus)		Teaching methods	Notes
1.	Introduction. The conical projection. The cillindrical projection. Representation of the point. Dividing the space in dihedral angles, trihedral angles and octants. The double orthogonal projection (Monge projection). The orthographic representation of the point. The symmetry of the point.	The course is taught classically (lecture followed by drawings made with the chalk on blackboard) 75%, accompanied by multimedia presentations (videoprojector).	
2.	Representation of the straight line. Projections. The oblique line. The particular lines. The relative positions of two lines. The projection of the angles.		
3.	Representation of the plane. The oblique plane. Particular planes. The relative positions of two planes. The position of the point relative to the plane.		
4.	The intersection of two planes. Representation of the plates.		

	The intersection of a line with a plane. The intersection of a line with a plate. The intersection of two plates.		
5.	Methods of transforming projections. The method of substitution of projection planes.		
6.	Methods of transforming projections. The revolution.		
7.	Methods of transforming projections. The coincidence. The restoration.		
8.	Regular polyhedrons. Irregular polyhedrons. Conventions for the representation.		
9.	Plane sections with projecting planes and with oblique planes in polyhedrons. Developments. The interesction of aline and a polyhedron.		
10.	The mutual intersections of polyhedrons.		
11.	Curved surfaces: the cone and the cylinder. Conventions for representation. Plane sections. Developments.		
12.	The axonometric representation. The orthogonal axonometric projection. The oblique axonometric projection.		
13.	The projections with elevations. Fundamentals / Generalities.		
14.	The projections with elevations. Applications of the projections with elevations by solving the roofs and the platforms.		

Bibliography

In the TUC-N library:

1. Delia Drăgan, Raluca Nerișanu: *Geometrie descriptivă – Teorie și probleme – Theory and Problems of Descriptive Geometry,* Editura U.T.Press Cluj-Napoca, 2015.
2. Delia Drăgan, Carmen Mârza, Marinela Grănescu: *Geometrie descriptivă – Descriptive Geometry* Editura U.T.Press Cluj-Napoca, 2008.
3. Delia Drăgan, Carmen Mârza, Marinela Grănescu: *Geometrie descriptivă – Descriptive Geometry* Editura U.T.Press Cluj-Napoca, 2007.
4. Kathryn Holliday-Darr: Applied Descriptive Geometry, Second Edition, Delmar Cengage Learning, 1998.

8.2. Applications/Seminars		Teaching methods	Notes
1.	Introduction. Presenting the formats used in D.G. and the information box. Graphical constructions.	Lecture accompanied by drawings made with the chalk on blackboard	
2.	Representation of the point. The orthogonal projection on two and on three planes of projection.		
3.	Representation of the straight line.		
4.	Representation of the plane.		
5.	The intersection of a straight line with a plane, the intersection of two (three) planes.		
6.	The metho of substitution of the projection planes. The revolution.		
7.	The coincidence. The restoration.		
8.	Plane sections with projecting planes and with oblique planes in polyhedrons.		
9.	Polyhedrons. Developments. The intersection of a line with a polyhedron.		
10.	The cone and the cylinder. Plane sections. Developments.		
11.	The axonometric projection.		
12.	Applications of the projections with elevations by solving the roofs having equal slopes.		
13.	Applications of the projections with elevations by solving the platforms.		
14.	Recovers. Finish the portfolio.		

Bibliography

In the TUC-N library:

1. Delia Drăgan, Raluca Nerișanu: *Geometrie descriptivă – Teorie și probleme – Theory and Problems of Descriptive Geometry,* Editura U.T.Press Cluj-Napoca, 2015.
2. Delia Drăgan, Carmen Mârza, Marinela Grănescu, Raluca Nerișanu: *Geometrie descriptivă. Probleme - Descriptive Geometry.Problems* Editura U.T.Press Cluj-Napoca, 2011.

9. Bridging course contents with the expectations of the representatives of the community, professional associations and employers in the field

Acquired skills will be required for employees who will work in design offices and for those who will work in execution.

10. Evaluation

Activity type	10.1 Assessment criteria	10.2 Assessment methods	10.3 Weight in the final grade
Course	The graphical solving of 4 problems	Exam (E), time for evaluation, 2,5 hour	2/3
Applications	The assessment is made during the semester. One drafts a portfolio of drawings; each drawing is scored individually. The arithmetic average of drawing grades is made. The minimum average required: 5 (five) (WS).	Assessment during the semester, solving problems (WS).	1/3
10.4 Minimum standard of performance			
Each problem from the final exam have to be correctly solved, at least 50%. The average of the grades for the portfolio of drawings has to be minimum 5 (five) (WS≥5). The final grade ≥5.			

Date of filling in
October, 2017

Teachers in charge of seminars
Assist. Prof. PhD. Eng. Nerișanu Raluca

Assist. PhD Student Eng. Tudoreanu Adrian

Date of approval in the department
October, 2017

Head of department
Assoc. Prof. PhD. Eng. Gavril HODA