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, Raluca.Nerisanu@cfdp.utcluj.ro			
2.4	Teachers in charge of seminars			Assist. Prof. PhD. Eng. Nerișanu Raluca, Raluca.Nerisanu@cfdp.utcluj.ro			
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	56	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.

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 cylindrical projection. Types of objects representation.	The course is taught classically (lecture followed by drawings made with the	
2.	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 descriptive alphabet of the point.		
3.	Representation of the straight line. Projections. The traces of the line. The oblique line. The particular lines. The relative position of two lines. The projection of the angles and segments.		
4.	Representation of the plane. The oblique plane. Projections, traces. Particular planes. The relative position of two planes. The position of the point relative to the plane. The position of the straight line relative to the plane. The intersection of two planes. The intersection of the line with a plate. The intersection of two plates. Study of the visibility.		

5.	Methods of transforming projections. The method of substitution of projection planes. The revolution. The coincidence. The restoration.	chalk on blackboard) – 75%, accompanied by PowerPoint and Sketch presentations (videoprojector) – 25%.	
6.	Regular polyhedrons. Conventions for the representation. Plane sections with projecting planes and with oblique planes in polyhedrons. Developments. The interesction of a line and a polyhedron.		
7.	Irregular polyhedrons. Conventions for the representation. Plane sections with projecting planes and with oblique planes in polyhedrons. Developments. The interesction of a line and a polyhedron. Mutual intersections of polyhedrons.		
8.	Cylindrical surfaces. Conventions for representation. Plane sections. Developments. The intersection with a line.		
9.	Conical surfaces. Conventions for representation. Plane sections (elliptical section, parabolic section, hyperbolic section). Developments. The intersection with a line.		
10.	The orthogonal axonometric projection.		
11.	The oblique axonometric projection.		
12.	The projections with elevations. Fundamentals / Generalities.		
13.	The projections with elevations. Graphic solving of the roofs with slopes of equal inclination, inclusive of those with inner courtyard. Views. Developments of the slopes.		
14.	The projections with elevations. Topographic surfaces. Cuts and fill along a platform with an inclined road.		

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 models, drawings made with the	
2.	THE POINT. The orthogonal projection on two and on three planes of projection. The symmetry of the point relative to the planes of projection and the bisecting planes.		
3.	THE STRAIGHT LINE. Determining the traces of the line. Determining of the dihedral angles crossed by the line. The representation of the parallel, intersecting and disjoined lines. The representation of the particular lines. The perpendicular from an exterior point to a line. The true length of a line segment.		
4.	THE PLANE. The relative position of the line to the plane. The intersection of two and three planes. The intersection of the plates with the line, intersections of the plates, the study of the visibility.		
5.	METHODS OF TRANSFORMING PROJECTIONS. The method of substitution of projection planes.		
6.	METHODS OF TRANSFORMING PROJECTIONS. The revolution. The coincidence. The restoration.		

7.	POLYHEDRONS I. Plane sections in the regular polyhedrons. The true size of the sections. Developments. The intersection of a line and a polyhedron.	chalk on blackboard and multimedia presentations	
8.	POLYHEDRONS II. Plane sections in the irregular polyhedrons. The true size of the sections. Developments. The intersection of a line and a polyhedron.		
9.	THE CYLINDER. Plane sections in the cylinder (with particular and oblique planes). The true size of the sections. Developments. Determining the intersection points between the cylinder and the lines.		
10.	THE CONE. Plane sections in the cone (elliptical, parabolic, hyperbolic). The true size of the sections. Developments. Determining the intersection points between the cone and the lines.		
11.	THE PROJECTIONS WITH ELEVATIONS. Applications. Graphic solving the roofs. Views. Determining the true size of the slopes.		
12.	THE PROJECTIONS WITH ELEVATIONS. Applications. Topographic surfaces. Cuts and fill along a platform with an inclined road.		
13.	THE AXONOMETRIC PROJECTION. The representation of the solids in orthogonal axonometric projection.		
14.	THE AXONOMETRIC PROJECTION. The representation of the solids in frontal oblique axonometric projection (cavalier perspective) and in horizonthal oblique axonometric projection (military perspective).		

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 (E)	Exam (E), time for evaluation, 2 hour	2/3
Applications	The assessment is made during the semester by scoring the examination papers. The arithmetic average of the examination grades is made. The minimum average required: 5 (five) (WS). It is required to draw, also, a sketchbook.	Assessment during the semester, solving problems (WS).	1/3

10.4 Minimum standard of performance	
The eligibility conditions for taking part to the exam**:** The average of the grades for the portfolio of drawings has to be minimum 5 (five). Each problem from the final exam have to be correctly solved, at least 50%. The minimum average of the examination grades, required: 5 (five), according to the ECTS Regulation regarding the absences.	
The formula for obtaining the grade (G)	**G=2/3E+1/3WS**

Date of filling in	**Persons in charge of**	**Title Surname NAME**	**Signature**
18.09.2018	Course	Assist. Prof. PhD. Eng. Nerișanu Raluca	
	Applications	Assist. Prof. PhD. Eng. Nerișanu Raluca	

Date of approval in the department _____	Head of Department ..... Assoc. Prof. PhD. Eng. Gavril HODA
Date of approval in the Faculty Council _____	Dean Assoc. Prof. PhD. Eng. Nicolae CHIRA