SYLLABUS

1. Data about the program of study

1.1	Institution	The Technical University of Cluj-Napoca
1.2	Faculty	Faculty of constructions
1.3	Department	Rail Roads, Roads, Bridges
1.4	Field of study	Civil engineering
1.5	Cycle of study	Bachelor of Science
1.6	Program of study/Qualification	Transport infrastructure engineering
1.7	Form of education	Full time
1.8	Subject code	7.00

2. Data about the subject

2.1	Subject name			Modern methods of road design			
2.2	Subject area			Civil engineering			
2.3	Course responsible/lecturer			Conf. dr ing Gavril Hoda- gavril.hoda@icfdp.utcluj.ro			
2.4	Teachers in charge of seminars			S.l. Dr. Ing. Andrei Clitan- Andrei.CLITAN@cfdp.utcluj.ro			
2.5 Year of study	I	2.6 Semester	2	2.7 Assessment	E	2.8 Subject category	DA/DI

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	100	3.5 of which, course:	28	3.6 applications:	14

Individual study	hours
Manual, lecture material and notes, bibliography	28
Supplementary study in the library, online and in the field	9
Preparation for seminars/laboratory works, homework, reports, portfolios, essays	10
Tutoring	8
Exams and tests	6
Other activities	-

3.7	Total hours of individual study	58
3.8	Total hours per semester	100
3.9	Number of credit points	4

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, Observator Building, Nr.72-74 - Amphitheatre A5
5.2	For the applications	Cluj-Napoca, Clădirea Observator, Nr. 72-74 – Hall O102

6. Specific competences

Professional competences	The student should be able to know how to operate a computer, road designing, Topography, Hydraulic Calculus, AutoCAD drawing, Highways, Urban Roads, Designing (rehabilitation) a road, specifying all the necessary elements for the execution stage using Civil 3D or ARD, the structure and how to compose a road structure. To apply the national and European Standards, norms and technical requirements regarding road designing. Road designing using AutoCAD and Civil software.
Cross competences	Familiarity with the roles and activities specific to teamwork.

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

7.1	General objective	Development of skills and competencies needed for road design using software. Knowing and implementing National and European Standards, norms and technical requirements, modelling the structures using software, other design elements.
7.2	Specific objectives	Road designing using CAD software: Civil 3D, Advanced Road Design.

8. Contents

8.1. Lecture (syllabus)	Teaching methods	Notes
General elements of road designing. General rules for geometric roadway design: horizontal, profile and cross-section. Particularities regarding the design of new and existing roads (rehabilitation, modernization). Types of circular horizontal curves.	Presentation, discussion	Projector
Design regulation for roads, streets, intersections. Design requirements.		
Urban roads, streets, ring roads design elements. Street elements, particularities. Types of roads networks, their design, execution details.		
Building and dimensioning road structures. Checking thaw frost of road structures.		
Optical comfort. Visibility in plan.		
Software used for road designing. General presentation, description, particularities.		
Civil 3D software. Description, working hypotheses, applicability		

AutoTURN Pro. Analysis of the area occupied by the body of a vehicle when traveling on a predetermined route. Verifying the correct application of the overcharges in the curve for current and oversized vehicles, 3d visualization of how a vehicle travels on a predetermined route		
TORUS: Automatic generation of the planar shape of the classic roundabouts (European and international norms). Automatic generation of the plane shape of the roundabout Movement evaluation of vehicles in various models of roundabouts. Animated 3d rendering of a roundabout with the presentation of how a vehicle is traveling.		
ParkCAD. Presentation of the regulations regarding the designing of parking lots. Defining the general elements of a parking lot at ground level. Designing a parking lot for cars.		
Advanced Road Design - ARD software. General presentation. Land surface processing. Horizontal design and longitudinal profile.		
Advanced Road Design - ARD software. Generating cross sections. Quantities extraction.		
Case studies – Paper presentations		
Case studies – Paper presentations		

Bibliography

UTC-N Library:

1. G. Hoda – Programe de calcul utilizate la proiectarea drumurilor
2. M. Beuran, M. Iliescu : , Constructia drumurilor.
3. S. Dorobantu : Drumuri.
4. Hoda G., Naş S. , Clitan A - Dimensionarea şi ranforsarea structurilor rutiere – teorie şi exemple de calcul, UT Press 2012.
5. * * * Standards, norms, technical requirements

.***Virtual teaching materials:***

Web videos and presentations

8.2. Applications/Seminars	Teaching methods	Notes
Horizontal design. Curve types. Civil Road Design software.	Presentation, discussion	Guidance for laboratory work. Standards, norms, technical requirements . Projector.
Horizontal design. Curve design. Civil Road Design software.		
Profile design using Civil Road Design software.		
Drawing the “Red Line” taking into account the minimum reinforcement thickness. Civil Road Design software.		
Cross section design using Civil Road Design software.		
Designing a road platform in horizontal plan using Civil Road Design software.		
Designing of the platforms cross section.		
Water drainage.		
Horizontal design using Advanced Road Design (ARD) software.		
Profile design using Advanced Road Design (ARD) software.		
Cross section design using Advanced Road Design (ARD) software.		

Quantities evaluation using Advanced Road Design (ARD) software.		
Editing and plotting using Advanced Road Design (ARD) software.		
Turning in and supporting the project.		

Bibliography

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1. G. Hoda – Programe de calcul utilizate la proiectarea drumurilor
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4. Hoda G., Naş S. , Clitan A - Dimensionarea şi ranforsarea structurilor rutiere – teorie şi exemple de calcul, UT Press 2012.
5. * * * Standards, norms, technical requirements.

Virtual teaching materials:

Web videos and presentations

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

The acquired skills will be needed for the employees who work in the field of research, design and execution of roads and bridges.

10. Evaluation

Activity type	10.1 Assessment criteria	10.2 Assessment methods	10.3 Weight in the final grade
10.4 Course	Theory test	Written test – 2 hours	67%
10.5 Applications	Project evaluation.	Written test – 1 hour	33%
10.6 Minimum standard of performance			
The minimum grade required for: • Theoretical exam (T): ≥ 5 • Applications (L) : L= 60% practical work + 40% laboratory, $L \geq 5$			

Date of filling in:		**Title Surname Name**	**Signature**
29.10.2019	Lecturer	Conf. dr ing Gavril Hoda	
	Teachers in charge of application	S.l. Dr. Ing. Andrei Clitan	

Date of approval in the department ……..

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Head of department
Conf. dr ing Gavril Hoda

Date of approval in the faculty

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Dean
Conf. dr ing Nicolae Chira