SYLLABUS

1. Data about the program of study

1.1	Institution	Technical University of Cluj-Napoca
1.2	Faculty	Faculty of Automotive, Mechatronics and Mechanical Engineering
1.3	Department	Department of Mechatronics and Machine Dynamics
1.4	Field of study	Mechatronics and Robotics
1.5	Cycle of study	Bachelor of Science
1.6	Program of study/Qualification	Mechatronics
1.7	Form of education	Full time

2. Data about the subject

2.1	Subject name			***Technical Drawing and Infographics***		Subject code	**11.00**
2.2	Course responsible/lecturer			*Conf.dr.ing. Andrei KIRALY andrei.Kiraly@auto.utcluj.ro*			
2.3	Teachers in charge of seminars			*as.ing. Budişan Tiberiu – tiberiu.budisan@auto.utcluj.ro* *as.dr.ing. Prodan Călin – vasile.prodan@auto.utcluj.ro*			
2.4 Year of study	1	2.5 Semester	2	2.6 Assessment			C
2.7 Subject category DID DOB	Formative category						DF
	Optionality						DOB

3. Estimated total time

3.1 Number of hours per week	4	of which	3.2 Course	2	3.3 Seminar		3.3 Laboratory	2	3.3 Project	
3.4 Total hours in the curriculum	100	of which	3.5 Course	28	3.6 Seminar		3.6 Laboratory	28	3.6 Project	

3.7 Individual study:	
(a) Manual, lecture material and notes, bibliography	14
(b) Supplementary study in the library, online and in the field	14
(c) Preparation for seminars/laboratory works, homework, reports, portfolios, essays	10
(d) Tutoring	-
(e) Exams and tests	6
(f) Other activities	-

3.8 Total hours of individual study (sum (3.7(a)…3.7(f)))	44
3.9 Total hours per semester (3.4+3.8)	100
3.10 Number of credit points	4

4. Pre-requisites (where appropriate)

4.1	Curriculum	-
4.2	Competence	-

5. Requirements (where appropriate)

5.1	For the course	N/A

5.2	For the applications	Drawing boards, drawing tools

6. Specific competences

Professional competences	C1.1 Express through written and oral communication in technical language the theoretical fundamentals of engineering C1.3 Select principles, methods and procedures of research and design in order to solve specific engineering problems
Cross competences	CT1 Complying with the principles, rules and values of the professional code of ethics by approaching a rigorous, effective and responsible work strategy in problem solving and decision making CT2 Application of the techniques of relationship and effective work in a multidisciplinary team, on different hierarchical levels, within the work team - specific project management CT3 Appropriate use of effective lifelong learning methods and techniques; appropriate use of information and oral and written communication in a European language

7. Expected learning outcomes

Knowledge	• knowledge of the fundamental principles of technical drawing and of national and international standards for technical drawing • understanding of the projection methods used in the representation of mechanical parts and assemblies • knowledge of the rules for dimensioning, notation, and symbolization in technical drawing • understanding of how to represent different types of assemblies • knowledge of concepts related to dimensional and geometric deviations and the indication of surface conditions
Skills	• Accurately creating technical drawings of parts and assemblies using orthogonal projections • Selecting and applying appropriate graphical methods for representing mechanical elements • Interpreting and analyzing working drawings in accordance with standardized norms • representing and dimensioning parts of varying degrees of complexity, including threaded parts and assemblies • compiling a portfolio of technical work (sketches and scaled drawings) that is accurate and complete • using tools and techniques specific to technical drawing (manual or computer-aided)
Responsibility and autonomy	• Compliance with technical standards and norms when creating drawings • Taking responsibility for the accuracy and quality of the work performed • effectively managing time to complete assignments and build a portfolio • developing logical and rigorous engineering thinking in solving graphic problems • demonstrating independence in research and in choosing representation solutions • collaborating responsibly during lab activities and adhering to established requirements

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

8.1	General objective	- transmission and mastery by students of the rules of representation of objects in space in plan, on the basis of established rules and norms, in order to express a technical idea or conception relating to a machine, device, apparatus or installation
8.2	Specific objectives	- mastering a unified technical language in order to ensure proper cooperation between the designer and the contractor for the practical realization of the designed products

9. Contents

9.1. Lecture (syllabus)	Number of hours	Teaching methods	Notes
1.Layout of projections. Views. Rules for representing views.	2	PowerPoint presentations	
2.Sections. Rules of representation of sections. Classification of sections. Representation and dimensioning of flanges.	2		
3. General dimensioning rules. Thread representation, dimensioning and notation	2		
4. Threaded assembly representation.	2		
5.Representing assemblies by wedges.	2		
6. Representation of groove assemblies.	2		
7.Representation and dimensioning of elastic elements and elastic assemblies.	2		
8. Representation and dimensioning of riveted assemblies.	2		
9. Representation and dimensioning of welded assemblies.	2		
10. Geometric accuracy of the finished product. Notation of roughness, dimensional and geometric deviations	2		
11. Representation of trees and axes.	2		
12. Representation of gears and gearing	2		
13. Representation of bearings and sealing elements.	2		
14.Detail extraction. Parts shape design.	2		

Bibliography

1. Bodea, S, Scurtu, L., *Geometrie descriptivă şi desen tehnic*, Editura RISOPRINT, ISBN ISBN 978-973-53-1902-1, Cluj-Napoca, 2016
2. Bodea, S., *Desen tehnic*, Editura RISOPRINT, ISBN973-656-880-6,Cluj-N, 2005.
3. Bodea, S., *Grafică inginerească*, Editura RISOPRINT, 978-973-53-0144-6,Cluj-N, 2010.
4. Crişan, N., Bodea, S., Scurtu, L*., Desen tehnic pentru asamblări în proiectare,* Editura RISOPRINT, Cluj-Napoca, 2012.

9.2. Seminars /Laboratory/Project	Number of hours	Teaching methods	Notes
1.Establish the minimum number of projections needed to represent a piece. Third projection	2	Practical applications	

2.Part complexity I (without thread)	2	solved with drawing tools.Case study on different parts and assemblies	
3. Representation and dimensioning part complexity II (threaded)	2		
4. Representation and dimensioning of flanges	2		
5.Representation and dimensioning of the fitting - sketch	2		
6. Representation and dimensioning of the fitting - scale drawing	2		
7.N1 - Sections + working drawing for a given construction form	2		
8. Representation of a threaded assembly of two parts + working drawings of the two parts	2		
9.Wedge assemblies (3 types + working drawings for the component parts of an assembly)	2		
10.Welded assemblies (8 tabular types + detailed and simplified representation of a scaled welded assembly	2		
11. Representation of trees and axes.	2		
12. Representation of gears and gearing	2		
13.N2 - Assemblies + Shafts, Gears	2		
14. Closing of the work - handing in the portfolios	2		

Bibliography

1. Bodea, S, Scurtu, L., *Geometrie descriptivă şi desen tehnic*, Editura RISOPRINT, ISBN ISBN 978-973-53-1902-1, Cluj-Napoca, 2016
2. Bodea, S., *Grafică inginerească*, Editura RISOPRINT, 978-973-53-0144-6,Cluj-Napoca, 2010.
3. Crişan, N., Bodea, S., Scurtu, L*., Desen tehnic pentru asamblări în proiectare,* Editura RISOPRINT, Cluj-Napoca, 2012.
4. Precupeţu,P. ş.a. *Desen tehnic industrial pentru construcţii de maşini*, Editura Tehnică, Bucureşti, 1990

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

Regular discussions with subject specialist subject holders and employer representatives. Continuous adaptation of subject content to the requirements expressed.

11. Evaluation

Activity type	11.1 Assessment criteria	11.2 Assessment methods	11.3 Weight in the final grade
11.4 Course	Theory and applications	N1, N2 - Written tests - 4 hours	75%
11.5 Seminars /Laboratory/Project	Portfolio of current weekly work	N3_ Practical work - 2 hours/week.	25%
11.6 Minimum standard of performance			
N1≥ 5; N2≥ 5; N3≥ 5			

Date of filling in:	Responsible	Title Surname Name	Signature
11.05.2026	Courses	Conf.dr.ing. Andrei KIRALY	
	Applications	Conf.dr.ing. Andrei KIRALY	
		as.dr.ing. Prodan Călin	
		as.ing. Budişan Tiberiu	

Approval from the Head of the Department coordinating the course, only if this is different from the department organizing the study program.	Head of Department Prof.Dr.Ing. Istvan Barabas

Date of approval in the Department of Mechatronics and Machine Dynamics 28.05.2026	Head of Department Prof.dr.eng. Mircea Bara
Date of approval in the Faculty of Automotive, Mechatronics and Mechanical Engineering 16.09.2026	Dean Prof.dr.eng. Nicolae Filip