POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

ACADEMIC YEAR: 2021/2022

1. GENERAL COURSE INFORMATION				
1.1 Course name	**Technical drawing**			
1.2 Study program/s	Undergraduate professional study Sustainable Development			
1.3 Course status (O,E)	Obligation	**1.6 Mode of instruction (number of hours)**	**Lectures**	15
1.4 Course code			**Exercises**	45
1.5 Course abbreviation	TC - TTS		**Seminars**	
1.6 Semester	I		**E-learning**	
1.7 ECTS	5	**1.7 Place and time of instruction**	Premises of the Polytechnic of Međimurje in Čakovec, according to the schedule published on the website	
2. TEACHING STAFF				
2.1 Course leader/s-title	prof. Sarajko Baksa, Ph.D.	**contact**	sbaksa@mev.hr	
	- - -	**contact**	- - -	
2.2 Assistant/s- title	- - -	**contact**	- - -	
	- - -	**contact**	- - -	
2.3 Instruction held by-title	- - -	**contact**	- - -	

3. COURSE DESCRIPTION	
3.1 Course goals	The aim of the course is to enable students to independently create and understand drawings and technical documentation within the draft postulates of technical professions. Acquisition of basic knowledge within the field of spatial dawn and orthogonal projection. Freehand sketching in projection and isometry, technical script, types of lines and quotations. Understanding and adoption of symbols within technical drawings, equipping technical documentation, application of computers in the organization and computerization of offices in the segment of eco-engineering, mechanical engineering and civil engineering. Furthermore, the aim of the course is to adopt the use of modern CAD 2D and 3D software solutions within the office business as well as the development of complex technical - technological BIM documents.
3.2 Prerequisites	They are not defined
3.3 Course outcomes	After successfully passing the course, the student will be able to: 1. Recognize the rules of orthogonal projection and choose the most efficient form of 2D / 3D object display. 2. Use sketching techniques and distinguish the effects of individual 2D and 3D sketching techniques in representing shapes. 3. Determine the optimal and analyze the derived 2D / 3D integration display technology. 4. Recognize and select optimal levels and principles of drawing in orthogonal and isometric projection. 5. Identify and select the appropriate project assembly modules of all positions in two or three orthogonal projections. 6. Identify the application of the projection and offer appropriate projections in view with the cross section shown.

3.4 Course content

3.5 Types of coursework

x	Lectures	x	Exercises	x	Blended e-learning	x	Individual activities		Laboratory
x	Seminars and workshops	x	Distant learning	x	Field classes	x	Multimedia and network	x	Mentorship
	Other								

3.6 Language of instruction

Croatian / English

3.7 Monitoring students' work (enter the number of ECTS credits for each activity so that the total number of ECTS credits is equal to the total ECTS value of the course, 1 ECTS = 30 hours)

2,0	Class attendance	0,3	Seminars		Essay
0,3	Class activity	0,3	Project		Report/paper
	Midterm exams	0,3	Practical task	0,3	Continuous knowledge check
1,0	Written exam		Experimental work		
0,5	Oral exam		Research		

3.8 Assessment and evaluation of students' work during classes and at the final exam

Activity specification	Percent %	Points
Assessment during instruction		
Attendance	5%	5
Class activity	5%	5
Project / Practical work	20%	20
Seminar / Colloquium I	20%	20
Seminar / Colloquium II	20%	20
Oral exam	30%	30
Exam assessment for the students who failed to fullfil all the obligatory requirements during the semester		
Written exam	*60%*	*60*
Total:	**100%**	**100**

3.9 Assessment criteria – analysis per learning outcomes

Ways of evaluating learning outcomes							
	Atten-dance	**Activity**	**Project**	**Mid-term exam 1**	**Mid-term exam 2**	**Practic work**	**Total**
Outcome 1			3	6		5	14
Outcome 2			3	6		5	14
Outcome 3			3	8		5	16
Outcome 4			3		6	5	14
Outcome 5			4		6	5	15
Outcome 6			4		8	5	17
Outcome not-related	5	5					10
Total	**5**	**5**	**20**	**20**	**20**	**30**	**100**

The course has defined 6 learning outcomes, a system of scoring outcomes, in order to pass the exam the student must achieve at least 50% points for each learning outcome.

The grade is calculated as follows:

- 87.51-100.00 points: rating Excellent (5)
- 75.01- 87.5 points: rating Very good (4)
- 62.51 -75.00 points: rating Good (3)
- 50.01- 62.5 points: rating Pass (2)
- 00.00- 50.00 points: rating Fail (1)

3.10 Specific features related with taking the course	If the student collects 50% of the points of each outcome, he / she directly takes the exam, provided that he / she has done practical work (seminars / project). During the exam, it is possible to orally check the knowledge from practical work (seminars / project). Once earned points for each learning outcome are no longer deleted unless the student, with the express approval of the course leader, decides to correct the result for each learning outcome, whereby the points won are deleted and newly earned points for that learning outcome are entered. The final grade is obtained on the exam period and is the sum of points earned during classes. Students who did not take the colloquium access the written part of the exam where all learning outcomes are checked, and are required to have completed practical work (seminars / project) before taking the exam.	
3.11 Students obligations	Full-time students are required to attend at least 70% of the total number of hours of lectures and exercises in order to exercise the right to take the exam. Part-time students are required to attend at least 30% of the total number of hours of lectures and exercises in order to exercise the right to take the exam. If the student has not fulfilled all the obligations set by the course, he is obliged to attend the lectures again and meet the conditions for taking the exam. Attendance can be offset by online tuition, organised webinars and added assignments given by teachers. One lesson lasts 45 minutes, and several hours form a teaching unit. Absence from one teaching unit is counted as one absence. Delays and apologies are recorded separately. In that case, if the student missed more than 50% of classes, and has a justifiable reason/apology, the request should be submitted to the Department Council, which then decides on the justification of student absences with the obligatory opinion of the course leader.	
3.12 Written assignments	Seminars / Projects	
3.13 Required reading	1.	M. Opalić, M. Kljajin, S. Sebastijanović: Tehničko crtanje, Zrinski Čakovec 2003
	2.	S. Baksa: Konstrukcijske metode računalnog 3D modeliranja, MEV 2018.
3.14 Additional reading	1.	Z. Herold: Inženjerski priručnik, Inženjerska grafika, Školska knjiga, Zagreb 1994.
4 ADDITIONAL COURSE INFORMATION		
4.1 Quality control	The quality of the program, teaching process, teaching skills and level of mastery of the material will be established by conducting a written evaluation based on questionnaires, and in other standardised ways and in accordance with the by-laws of the Polytechnic of Međimurje in Čakovec.	
4.2 Contact the teacher	Students can contact the teacher during the office hours and during classes, while for short questions and explanations they can contact him/her any day during working hours by coming in person or by landline. It is possible to ask questions and e-mail which will be answered as soon as possible.	

4.3 Information about the course	It is the obligation of each student to be regularly informed about the course. All relevant information and notices related to classes and exams, maintenance or any year, will be reported in a timely manner on the bulletin board and on the website of the Polytechnic of Međimurje in Čakovec.
4.4 Course contribution to the study program	Course contribution to the study program in generic learning outcomes; I1 - Interpret information, ideas, problems and solutions to professional and General public, I3 - Use foreign languages in professional communication and use of professional literature, I5 - Critically evaluate arguments, assumptions and data in order to create opinions and contributing to the solution of the problem. The contribution of the course to the study program in specific learning outcomes; I11 - Apply basics of thermoenergetics, thermodynamics and hydromechanics in spatial design of thermodynamic systems, I12 - Develop a technical plan in the field of design of Mechanical Thermotechnical System, I17 - Create an architectural and urban solution by applying basic principles Design of low-energy buildings with the use of modern computer systems.

5. ANALYSIS OF COURSE TOPICS (the number of hours is equal to the number of lectures and exercises of the course)

LECTURES

Hours	Topic and description	**Method** • Direct teaching (lecture, instruction, pp presentation) • Discovery learning (individual, lead, discussion) • Group learning • Case study • Field classes…	Learning outcomes	Course outcome
1.	Introduction to course content, standardization and norms	Lecture, Discovery learning, Presentation	Use standardization and norm sequences	I1
2.	Lines, technical letter, paper formats for technical drawings, scales	Lecture, Discovery learning, Presentation	Distinguish between models of technical drawings and related scales	I1
3.	Types of lines, paper, technical letter	Lecture, Discovery learning, Presentation	Distinguish between technical letter and drawing models	I1
4.	Recommendations for presenting forms with simplifications in general	Lecture, Discovery learning, Presentation	Use a variety of forms of presentation	I2

5.	One-part model, independent sketching of individual parts in orthogonal projection and isometry	Lecture, Discovery learning, Presentation	Distinguish between orthogonal and isometric projection	I3
6.	Drawing of the sketched part	Lecture, Discovery learning, Presentation	Use knowledge of technical sketching	I3
7.	Sketching in orthogonal projection	Lecture, Discovery learning, Presentation	Apply and distinguish sketching in orthogonal projection	I4
8.	Spatial representation and quotation	Lecture, Discovery learning, Presentation	Apply spatial representation and quotation	I4
9.	Sketching of all positions as in a one-part model, with sketching of the assembly in two or three orthogonal projections and view (draft obligatory in cross section)	Lecture, Discovery learning, Presentation	Use knowledge of positional technical sketching	I4
10.	Assembly	Lecture, Discovery learning, Presentation	Apply basic assembly syntax	I5
11.	Assembly and assembly drawing	Lecture, Discovery learning, Presentation	Apply the concept of assembly and circuit drawing	I5
12.	Assembly and assembly drawing positions	Lecture, Discovery learning, Presentation	Explain the positions of the assembly and the assembly technical drawing	I5
13.	Processing and tolerances of shapes and positions	Lecture, Discovery learning, Presentation	Explain the processing procedure and tolerance of shape and position	I5
14.	Computer drawing creation	Lecture, Discovery learning, Presentation	Apply computer-aided drawing creation	I6
15.	Computer drawing creation	Lecture, Discovery learning, Presentation	Apply computer-aided drawing creation	I6
EXERCISES/ SEMINARS				
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1.	Introduction to course content, standardization and norms	Lecture, Discovery learning, Presentation	Use standardization and norm sequences	I1

2.	Lines, technical letter, paper formats for technical drawings, scales	Lecture, Discovery learning, Presentation	Distinguish between models of technical drawings and related scales	I1
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14.	Computer drawing creation	Lecture, Discovery learning, Presentation	Apply computer-aided drawing creation	I6
15.	Computer drawing creation	Lecture, Discovery learning, Presentation	Apply computer-aided drawing creation	I6