POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

ACADEMIC YEAR: 2020/2021

1. GENERAL COURSE INFORMATION

1.1 Course name	**Applied statistics**			
1.2 Study program/s	Undergraduate professional study of Sustainable Development			
1.3 Course status (O,E)	O - obligatory	**1.6 Mode of instruction (number of hours)**	**Lectures**	30
1.4 Course code			**Exercises**	30
1.5 Course abbreviation	PS		**Seminars**	
1.6 Semester	II.		**E-learning**	
1.7 ECTS	5	**1.7 Place and time of instruction**	Lecture halls of the Polytechnic of Međimurje in Čakovec, according to the class schedule published on the website	

2. TEACHING STAFF

2.1 Course leader/s-title	mr.sc. Drago Franciškoviċ, Senior Lecturer	**contact**	drago.franciskovic@mev.hr
		contact	
2.2 Assistant/s- title		**contact**	
2.3 Instruction held by-title	mr.sc. Drago Franciškoviċ, Senior Lecturer	**contact**	drago.franciskovic@mev.hr

3. COURSE DESCRIPTION

3.1 Course goals	Introduce students to the basic concepts of statistics and statistical methods. To enable students to use basic methods of descriptive statistics, regression analysis and to demonstrate the application of statistical tests. To enable students to use the acquired knowledge with the application of computers.
3.2 Prerequisites	There are no prerequisites.
3.3 Course outcomes	1. Explain the basic concepts of statistical methods, types of data and types of sampling. R5 2. Collect, edit, and tabulate statistics. R6 3. Graphical interpretation of data. R6 4. Determine statistical measures and interpret them. Determine the measures of asymmetry, and interpret it. R6 5. Apply regression and correlation analysis and draw a conclusion. R6 6. Statistical tests. R5a conclusion. R6
3.4 Course content	

3.5 Types of coursework	X	Lectures	X	Exercises	X	Blended e-learning	X	Individual activities	X	Laboratory
		Seminars and workshops	X	Distant learning		Field classes		Multimedia and network		Mentorship
		Other	Self-learning from given materials							
3.6 Language of instruction										

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

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

Activity specification	Percent %	Points
Evaluation during classes		
Class attendance	4,00%	6
Activity during classes	12,00%	18
Test 1	12,00%	18
Test 2	12,00%	18
Test 3	12,00%	18
Colloquium 1	16,00%	24
Colloquium 2	16,00%	24
Colloquium 3	16,00%	24
Evaluation of exam work for students who did not pass the colloquiums and tests		
Written exam	86,00%	126
Total:	**100,00%**	**150**

3.9 Assessment criteria – analysis per learning outcomes

	Ways of evaluating learning outcomes					
	Continuous knowledge check (tests 1, 2 and 3)	**Seminar**	Colloquium **1**	Colloquium **2**	Colloquium **3**	**Total**
Outcome 1	9		12			21
Outcome 2	9		12			21
Outcome 3	9			24		21
Outcome 4	9				12	21
Outcome 5	9				12	21
Outcome 6	9					21
Outside the outcome						24
Total	54		20	24	28	150

Grading of outcomes (in order to pass the mid-term exam/final exam the student must achieve at least 50% points for each learning outcome)

Points	Grade
127,50 – 150,00	excellent (5)
112,50 – 127,49	very good (4)
93,75 – 112,49	good (3)
75,00 – 93,74	pass (2)
0,00 – 74,49	fail (1)

3.10 Specific features related with taking the course

During the course, students will write 3 midterm exams. As a rule, midterms are written after every 4 to 5 weeks of classes and cover the learning outcomes covered during that period. As a rule, separate intermediate exams are written separately from theory (tests) and from practical tasks (colloquium). The type of questions and tasks in the midterm exams is defined by the teacher, but all questions and tasks cover the course material or learning outcomes. Regardless of the number of points achieved in an intermediate exam or

	according to a learning outcome, the student can access all subsequent intermediate exams and other knowledge tests. Only points that are at least 50% of the maximum amount of points per learning outcome are recognized for the final grade. Once student won points in intermediate exams (colloquiums) for each learning outcome are no longer deleted unless the student decides to improve the result for each learning outcome, whereby the points won until then are deleted and newly earned points for that learning outcome are entered if they are more favorable for the students. Student who have not passed all intermediate exams, have the opportunity to correct the exam deadlines on which, as a rule, they take the material in its entirety. Points earned by assignments, attendance and other activities are retained by the student throughout the academic year and can only be corrected exceptionally, with the express approval of the subject teacher.	
3.11 Students obligations	Students have the obligation to attend classes regularly, be active in class and work on learning, practicing and determining the teaching material at home in the fund of hours provided by the ECTS credit system. Full-time students must attend at least 70% of the total number of lecture hours and at least 70% of the total number of practice hours in order to register for the exam. Part-time students must attend at least 50% of the total number of hours of lectures provided for them and at least 50% of the total number of hours of exercises provided for them in order to be able to register for the exam. Otherwise they cannot take the exams and have to re-enroll the subject. Students who for some reason do not have to attend classes are required to periodically contact teachers during classes, by email or by coming to consultations, related to classes and teaching materials. Students who frequently disrupt classes will be removed from class, and their attendance will not be recorded.	
3.12 Written assignments		
3.13 Required reading	1.	D. Franciškoviće: Osnove statistike – izdvojeni pojmovi, 2013 (besplatni nastavni materijal dostupan studentima)
	2.	D. Franciškoviće – Poslovna matematika i statistika, dorađeni prijevod dijela knjige: Andre Francis, „Business Mathematics and Statistics“, 2004. (besplatni nastavni materijal dostupan studentima)
	3.	Students' own notes from lectures and exercises.
3.14 Additional reading	1.	Papić, M.(2012): Primijenjena statistika u MS Excelu; Naklada Zoro, Zagreb.
	2.	Šošić, I. (2008): Statistika, II izdanje; Školska knjiga, Zagreb, 1998.
	3.	Šošić, I. (2006): Primijenjena statistika; Školska knjiga, Zagreb.
4 ADDITIONAL COURSE INFORMATION		
4.1 Quality control	In accordance with the acts of the Polytechnic of Međimurje in Čakovec.	
4.2 Contact the teacher	Students can contact the teacher during the consultation period (two hours per week) and during classes, while for short questions and explanations they can contact any day during working hours by coming in person or by landline. It is also possible to ask questions by e-mail, which will be answered as soon as possible (except during weekends or holidays). It is recommended that students come for consultations as often as possible during the learning period, ie during the teaching period.	

4.3 Information about the course	It is the obligation of each student to be regularly informed about the course. All notifications about the holding or possible postponement of classes will be posted on the bulletin board and on the website of the Polytechnic at least 24 hours in advance.
4.4 Course contribution to the study program	Application of mathematical and statistical knowledge and skills to economic problems in practice.

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. Basic concepts (Definition and division of statistics. Statistical set. Characteristic / variable. Measuring scales - type and properties. Quantitative and qualitative characteristics.) Stages of statistical research. Grouping and tabulation of data.	Direct teaching and independent work.	Describe and apply in practice the adopted materials	O1, O2
2.	Repetition. Data sources. Data collection. Data matrix. Data editing. Statistical series. An example of poor use of statistics. Examples of presenting data in CBS reports. Graphical display of statistical data.	Direct teaching and independent work.	Describe and apply in practice the adopted materials	O2, O3
3.	A series of qualitative data (tabular and graphical representations). Mean values.	Direct teaching and independent work.	Describe and apply in practice the adopted materials	O2, O4
4.	A series of quantitative / numerical data (tabular and graphical representations). Mean values: mode, median.	Direct teaching and independent work.	Describe and apply in practice the adopted materials	O2, O4
5.	Repetition of material. Test. 1. Colloquium.	Direct teaching and independent work.	Describe and apply in practice the adopted materials	O1, O2

6.	Mean values: arithmetic mean, geometric mean, harmonic mean. Measures of dispersion: - range of variation, - interquartile and quartile deviation coefficient.	Direct teaching and independent work.	Describe and apply in practice the adopted materials	O4
7.	Variance, standard deviation and coefficient of variation.	Direct teaching and independent work.	Describe and apply in practice the adopted materials	O3, O4
8.	Mean absolute deviation (MAD). Standardized value of z. Repetition of material.	Direct teaching and independent work.	Describe and apply in practice the adopted materials	O3, O4
9.	Repetition. Test.	Direct teaching and independent work.	Describe and apply in practice the adopted materials	O3, O4
10.	Regression and correlation analysis	Direct teaching and independent work.	Describe and apply in practice the adopted materials	O4
11.	Repetition: regression and correlation analysis.	Direct teaching and independent work.	Describe and apply in practice the adopted materials	O5
12.	Statistical tests.	Direct teaching and independent work.	Describe and apply in practice the adopted materials	O6
13.	Example of a statistical test.	Direct teaching and independent work.	Describe and apply in practice the adopted materials	O6
14.	Repetition with examples from practice. Test. Colloquium.	Direct teaching and independent work.	Describe and apply in practice the adopted materials	O5, O6
15.	Review of processed material. Repetition of material. Writing a repair for the weakest colloquium.	Direct teaching and independent work.	Describe and apply in practice the adopted materials	O1, O2, O3, O4, O5
EXERCISES/ SEMINARS				
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. Basics about Excel. Relative and absolute addressing in Excel.	Direct teaching and independent work	Describe and apply in practice the adopted materials	
2.	Examples of sampling by generating random numbers and systematic sampling.	Direct teaching and independent work	Describe and apply in practice the adopted materials	O1
3.	Rounding errors. Interval arithmetic.	Direct teaching and independent work	Describe and apply in practice the adopted materials	O1

4.	Forming a simple frequency table.	Direct teaching and independent work	Describe and apply in practice the adopted materials	O2
5.	Forming a grouped frequency table.	Direct teaching and independent work	Describe and apply in practice the adopted materials	O2
6.	Histogram. 1. colloquium. Frequency polygon. Frequency curve.	Direct teaching and independent work	Describe and apply in practice the adopted materials	O2
7.	Polygon of cumulative (less than) percentage frequencies. Polygon of cumulative (more than) percentage frequencies.	Direct teaching and independent work	Describe and apply in practice the adopted materials	O3
8.	Bar charts. Pie charts. Line diagrams.	Direct teaching and independent work	Describe and apply in practice the adopted materials	O3
9.	Component, percentage, and multiple bar graph. Multiple pie chart. Layered chart.	Direct teaching and independent work	Describe and apply in practice the adopted materials	O3
10.	Measures of central tendency: arithmetic mean mode and median. Quantiles (quartiles, percentiles).	Direct teaching and independent work	Describe and apply in practice the adopted materials	O4
11.	Measures of central tendency: mode, geometric and harmonic mean. Standard deviation. 2nd colloquium.	Direct teaching and independent work	Describe and apply in practice the adopted materials	O4
12.	Linear, exponential and potential regression.	Direct teaching and independent work	Describe and apply in practice the adopted materials	O5
13.	Example of a statistical test.	Direct teaching and independent work	Describe and apply in practice the adopted materials	O6
14.	Example of a statistical test. Repetition.	Direct teaching and independent work	Describe and apply in practice the adopted materials	O6
15.	Test. Colloquium. Repetition of the weakest colloquium.	Direct teaching and independent work	Describe and apply in practice the adopted materials	O1, O2, O3, O4, O5, O6