



POLYTECHNIC OF MEĐIMURJE IN ČAKOVEC

COURSE SYLLABUS

ACADEMIC YEAR: 2020/2021

1. GENERAL COURSE INFORMATION

| | | | | |
|--------------------------------|--|--|--|----|
| 1.1 Course name | Basics of statistics | | | |
| 1.2 Study program/s | The specialist graduate professional study in Tourism and Sport Management | | | |
| 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 | OS | | Seminars | |
| 1.6 Semester | II. | | E-learning | |
| 1.7 ECTS | 7 | 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 Francišković, Senior Lecturer | contact | drago.franciskovic@mev.hr |
| | Tibor Rodiger, Lecturer | contact | |
| 2.2 Assistant/s- title | | contact | |
| | | contact | |
| 2.3 Instruction held by-title | mr.sc. Drago Francišković, Senior Lecturer | contact | drago.franciskovic@mev.hr |

3. COURSE DESCRIPTION

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| 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. To enable students to use the acquired knowledge with the application of computers. | | | | | | | | | |
| 3.2 Prerequisites | There are no prerequisites. | | | | | | | | | |
| 3.3 Course outcomes | <ol style="list-style-type: none"> 1. Explain the basic concepts of statistical methods, data types 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 measures of asymmetry, measures of concentration, draw a Lorenz curve and interpret it. R6 5. Apply regression and correlation analysis and draw a conclusion. R6 6. Apply time series and time series indices. R5 | | | | | | | | | |
| 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 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 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 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | Class activity | | Project | | Report/paper | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2 | Midterm exams | | Practical task | 2 | Continuous knowledge check | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Written exam | | Experimental work | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Oral exam | | Research | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 3.8 Assessment and evaluation of students' work during classes and at the final exam | <table border="1" data-bbox="603 595 1366 1021"> <thead> <tr> <th data-bbox="603 595 1011 629">Activity specification</th> <th data-bbox="1011 595 1187 629">Percent %</th> <th data-bbox="1187 595 1366 629">Points</th> </tr> </thead> <tbody> <tr> <td colspan="3" data-bbox="603 629 1366 663" style="text-align: center;"><i>Evaluation during classes</i></td> </tr> <tr> <td data-bbox="603 663 1011 696">Class attendance</td> <td data-bbox="1011 663 1187 696">4,00%</td> <td data-bbox="1187 663 1366 696">6</td> </tr> <tr> <td data-bbox="603 696 1011 730">Activity during classes</td> <td data-bbox="1011 696 1187 730">12,00%</td> <td data-bbox="1187 696 1366 730">18</td> </tr> <tr> <td data-bbox="603 730 1011 763">Test 1</td> <td data-bbox="1011 730 1187 763">12,00%</td> <td data-bbox="1187 730 1366 763">18</td> </tr> <tr> <td data-bbox="603 763 1011 797">Test 2</td> <td data-bbox="1011 763 1187 797">12,00%</td> <td data-bbox="1187 763 1366 797">18</td> </tr> <tr> <td data-bbox="603 797 1011 831">Test 3</td> <td data-bbox="1011 797 1187 831">12,00%</td> <td data-bbox="1187 797 1366 831">18</td> </tr> <tr> <td data-bbox="603 831 1011 864">Colloquium 1</td> <td data-bbox="1011 831 1187 864">16,00%</td> <td data-bbox="1187 831 1366 864">24</td> </tr> <tr> <td data-bbox="603 864 1011 898">Colloquium 2</td> <td data-bbox="1011 864 1187 898">16,00%</td> <td data-bbox="1187 864 1366 898">24</td> </tr> <tr> <td data-bbox="603 898 1011 931">Colloquium 3</td> <td data-bbox="1011 898 1187 931">16,00%</td> <td data-bbox="1187 898 1366 931">24</td> </tr> <tr> <td colspan="3" data-bbox="603 931 1366 965" style="text-align: center;"><i>Evaluation of exam work for students who did not pass the colloquiums and tests</i></td> </tr> <tr> <td data-bbox="603 965 1011 999">Written exam</td> <td data-bbox="1011 965 1187 999">86,00%</td> <td data-bbox="1187 965 1366 999">126</td> </tr> <tr> <td data-bbox="603 999 1011 1021">Total:</td> <td data-bbox="1011 999 1187 1021">100,00%</td> <td data-bbox="1187 999 1366 1021">150</td> </tr> </tbody> </table> | | | | | | Activity specification | Percent % | Points | <i>Evaluation during classes</i> | | | 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 | <i>Evaluation of exam work for students who did not pass the colloquiums and tests</i> | | | Written exam | 86,00% | 126 | Total: | 100,00% | 150 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Activity specification | Percent % | Points | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <i>Evaluation during classes</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 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 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <i>Evaluation of exam work for students who did not pass the colloquiums and tests</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Written exam | 86,00% | 126 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total: | 100,00% | 150 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3.9 Assessment criteria – analysis per learning outcomes | <table border="1" data-bbox="523 1111 1477 1536"> <thead> <tr> <th rowspan="2"></th> <th colspan="5">Ways of evaluating learning outcomes</th> <th rowspan="2">Total</th> </tr> <tr> <th>Continuous knowledge check (tests 1, 2 and 3)</th> <th>Seminar</th> <th>Colloquium 1</th> <th>Colloquium 2</th> <th>Colloquium 3</th> </tr> </thead> <tbody> <tr> <td>Outcome 1</td> <td>9</td> <td></td> <td>12</td> <td></td> <td></td> <td>21</td> </tr> <tr> <td>Outcome 2</td> <td>9</td> <td></td> <td>12</td> <td></td> <td></td> <td>21</td> </tr> <tr> <td>Outcome 3</td> <td>9</td> <td></td> <td></td> <td>24</td> <td></td> <td>21</td> </tr> <tr> <td>Outcome 4</td> <td>9</td> <td></td> <td></td> <td></td> <td>12</td> <td>21</td> </tr> <tr> <td>Outcome 5</td> <td>9</td> <td></td> <td></td> <td></td> <td>12</td> <td>21</td> </tr> <tr> <td>Outcome 6</td> <td>9</td> <td></td> <td></td> <td></td> <td></td> <td>21</td> </tr> <tr> <td>Outside the outcome</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>24</td> </tr> <tr> <td>Total</td> <td>54</td> <td></td> <td>20</td> <td>24</td> <td>28</td> <td>150</td> </tr> </tbody> </table> <p data-bbox="523 1559 1398 1626">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)</p> <p data-bbox="523 1637 919 1850">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)</p> | | | | | | | Ways of evaluating learning outcomes | | | | | Total | Continuous knowledge check (tests 1, 2 and 3) | Seminar | Colloquium 1 | Colloquium 2 | Colloquium 3 | 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 |
| | Ways of evaluating learning outcomes | | | | | Total | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Continuous knowledge check (tests 1, 2 and 3) | Seminar | Colloquium 1 | Colloquium 2 | Colloquium 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 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 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3.10 Specific features related with taking the course | <p data-bbox="523 1888 1477 2051">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,</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| | <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> | | | | | | | | | | |
| 3.11 Students obligations | <p>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.</p> <p>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.</p> <p>Students who frequently disrupt classes will be removed from class, and their attendance will not be recorded.</p> | | | | | | | | | | |
| 3.12 Written assignments | | | | | | | | | | | |
| 3.13 Required reading | <table border="1"> <tr> <td>1.</td> <td>D. Francišković: Osnove statistike – izdvojeni pojmovi, 2013 (besplatni nastavni materijal dostupan studentima)</td> </tr> <tr> <td>2.</td> <td>D. Francišković – Poslovna matematika i statistika, dorađeni prijevod dijela knjige: Andre Francis, „Business Mathematics and Statistics“, 2004. (besplatni nastavni materijal dostupan studentima)</td> </tr> <tr> <td>3.</td> <td>Students' own notes from lectures and exercises.</td> </tr> <tr> <td></td> <td></td> </tr> </table> | 1. | D. Francišković: Osnove statistike – izdvojeni pojmovi, 2013 (besplatni nastavni materijal dostupan studentima) | 2. | D. Francišković – 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. | | | | |
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| 3. | Students' own notes from lectures and exercises. | | | | | | | | | | |
| | | | | | | | | | | | |
| 3.14 Additional reading | <table border="1"> <tr> <td>1.</td> <td>Papić, M.(2012): Primijenjena statistika u MS Excelu; Naklada Zoro, Zagreb.</td> </tr> <tr> <td>2.</td> <td>Šošić, I. (2008): Statistika, II izdanje; Školska knjiga, Zagreb, 1998.</td> </tr> <tr> <td>3.</td> <td>Šošić, I. (2006): Primijenjena statistika; Školska knjiga, Zagreb.</td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> </table> | 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. | | | | |
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| 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 | | | | | | | | | | |

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| | 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 | Learning outcomes | Course outcome |
| | | <ul style="list-style-type: none"> • Direct teaching (lecture, instruction, pp presentation) • Discovery learning (individual, lead, discussion) • Group learning • Case study • Field classes... | | |
| 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 | 01, 02 |
| 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 | 02, 03 |
| 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 | 02, 03, 04 |
| 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 | 02, 04 |

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| 5. | Repetition of material. Test. Colloquium. | Direct teaching and independent work. | Describe and apply in practice the adopted materials | O2, O3 |
| 6. | Mean values: arithmetic mean, geometric mean, harmonic mean. Measures of dispersion: - range of variation, - interquartile and coefficient of quartile deviation, - variance, standard deviation and coefficient of variation | Direct teaching and independent work. | Describe and apply in practice the adopted materials | O4 |
| 7. | Mean absolute deviation (MAD). Standardized value of z. Measures of asymmetry. | Direct teaching and independent work. | Describe and apply in practice the adopted materials | O4 |
| 8. | Concentration measures: Concentration ratio of order r, Herfindahl index, Lorenz curve and Gini coefficient. | Direct teaching and independent work. | Describe and apply in practice the adopted materials | O4 |
| 9. | Repetition. Test. Colloquium. | 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 | O5 |
| 11. | Repetition: regression and correlation analysis. | Direct teaching and independent work. | Describe and apply in practice the adopted materials | O5 |
| 12. | Time series - a concept. Individual indices (base and chain). | Direct teaching and independent work. | Describe and apply in practice the adopted materials | O6 |
| 13. | Time series - Aggregate price, quantity and value indices. | 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, O6 |

EXERCISES/ SEMINARS

| Hours | Topic and description | Method | Learning outcomes | Course outcome |
|-------|--|--|--|----------------|
| | | <ul style="list-style-type: none"> • Direct teaching (lecture, instruction, pp presentation) • Discovery learning (individual, lead, discussion) • Group learning • Case study • Field classes... | | |
| 1. | Introduction. Basics about Excel. Relative and absolute addressing in Excel. | Direct teaching and independent work | Describe and apply in practice the adopted materials | |

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|-----|---|--------------------------------------|--|----|
| 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. 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. | Direct teaching and independent work | Describe and apply in practice the adopted materials | O4 |
| 12. | Measures of asymmetry. Concentration measures. Lorenz curve. | Direct teaching and independent work | Describe and apply in practice the adopted materials | O4 |
| 13. | Linear, exponential and potential regression. | Direct teaching and independent work | Describe and apply in practice the adopted materials | O5 |
| 14. | Time series - a concept. Individual indices (base and chain). | Direct teaching and independent work | Describe and apply in practice the adopted materials | O6 |
| 15. | Time series - Aggregate indices. | Direct teaching and independent work | Describe and apply in practice the adopted materials | O6 |