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|--|-----------------------|---|-----------------------|
| Study program : Mathematics  |                       |   |                       |
| Type and level of studies: Undergraduate academic studies  |                       |   |                       |
| <b>Course unit: Probability</b>  |                       |   |                       |
| <b>Teacher in charge : Sladjana Dimitrijevic</b>   |                       |   |                       |
| Language of instruction: <i>English</i>  |                       |   |                       |
| ECTS: 7  |                       |   |                       |
| Prerequisites:   |                       |   |                       |
| Semester: <i>Winter Semester</i>   |                       |   |                       |
| <b>Course unit objective</b><br>A thorough knowledge and understanding of the theory of probability, especially space probability, random variables and their numerical characteristics  |                       |   |                       |
| <b>Learning outcomes of Course unit</b><br>The student has acquired necessary theoretical knowledge needed to understand the issues relating to the probability space, random variables, discrete and absolutely continuous type, as well as numerical characteristics of random variables.  |                       |   |                       |
| <b>Course unit contents</b><br><i>Theoretical classes</i><br>Probability space. $\sigma$ -field of events. Probability. Conditional probability. Independence of events. Random variables. Basic types of random variables (discrete and absolutely continuous type). Probability distribution function. Multidimensional random variables. Conditional distribution. The independence of random variables. Transformations of random variables.<br>Mathematical expectation. Moments. Chebyshev inequality. Conditional expectation. Characteristic function. Basic properties. Continuity of correspondence between distribution functions and characteristic functions.<br>Limit theorems of probability theory. Types of convergence. The laws of large numbers. Classical central limit theorems.<br><i>Practical classes</i><br>The practical application of the knowledge acquired through theoretical classes. |                       |   |                       |
| <b>Literature</b><br>1. R. Ash, Basic Probability Theory, Dover Publications, New York, 1970<br>2. E. Parzen, Modern Probability Theory and Its Applications, John Willey & sons, New York, 1960.  |                       |   |                       |
| <b>Number of active teaching hours</b>   |                       |   | <b>Other classes</b>  |
| Lectures:<br>45  | Practice:<br>45       | Other forms of classes: <i>mentoring system</i> |                       |
| <b>Teaching methods</b>  |                       |   |                       |
| <b>Examination methods ( maximum 100 points)</b>   |                       |   |                       |
| <b>Exam prerequisites</b>  | <b>No. of points:</b> | <b>Final exam</b>                               | <b>No. of points:</b> |
| Student's activity during lectures   | <b>4</b>              | oral examination                                | <b>50</b>             |
| practical classes/tests  | <b>46</b>             | written examination                             |                       |
| Seminars/homework  |                       | .....   |                       |
| Project  |                       |   |                       |
| Other  |                       |   |                       |
| <b>Grading system</b>  |                       |   |                       |
| <b>Grade</b>   | <b>No. of points</b>  | <b>Description</b>                              |                       |
| <b>10</b>  | <b>91-100</b>         | Excellent                                       |                       |
| <b>9</b>   | <b>81-90</b>          | Exceptionally good                              |                       |
| <b>8</b>   | <b>71-80</b>          | Very good                                       |                       |

|          |              |         |
|----------|--------------|---------|
| <b>7</b> | <b>61-70</b> | Good    |
| <b>6</b> | <b>51-60</b> | Passing |
| <b>5</b> | <b>0-50</b>  | Failing |

**(Table 5.2) Course unit description**