**Course description**

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| **Generic information** | | | |
| Head of Course | Dr.sc. Biserka Draščić Ban | | |
| Course | Applied Mathematics | | |
| Study Programme | Marine Engineering and Maritime Transport Technology | | |
| Type of Course | mandatory | | |
| Year of Study | 1. |  | |
| Estimated Student Workload and Methods of Instruction | ECTS coefficient of Student Workload | | 6 |
| Number of Hours (L+E+S) | | 30+30+0 (2+2+0) |

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| **1. GENERAL COURSE DESCRIPTION** | | | | | | | | |
| *1.1. Course Objectives* | | | | | | | | |
| Introduction to the elements of numerical mathematics and the basic concepts of probability theory. | | | | | | | | |
| *1.2. Prerequisites for Course Registration* | | | | | | | | |
| none | | | | | | | | |
| *1.3. Expected Learning Outcomes* | | | | | | | | |
| 1. Describe the space of elementary events 2. Explain and apply probability to specific problems in practice 3. Recognize and apply the Total probability and Bayesian formula 4. Describe random variables 5. Use and calculate numerical characteristics of random variables 6. State and apply the Poisson and Moivre - Laplace theorems in specific situations 7. Calculate the errors in the approximate calculation 8. Describe and apply interpolation polynomials, numerical methods for solving equations, and numerical integration | | | | | | | | |
| *1.4. Course Outline* | | | | | | | | |
| The space of elementary events. Probability. Total probability and Bayesian formulas. Random variables. Numerical characteristics of random variables. Binomial, Poisson, uniform, normal distribution. Poisson's and Moivre-Laplace theorems. Error analysis. Interpolation. Numerical solution of equations. Numerical integration | | | | | | | | |
| *1.5. Modes of*  *Instruction* | | Lectures  Seminars and workshops  Exercises  E-learning  Field work | | | Practical work  Multimedia and Network  Laboratory  Mentorship  Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | |
| *1.6. Comments* | |  | | | | | | |
| *1.7. Student Obligations* | | | | | | | | |
| Regular attendance at classes and homework. | | | | | | | | |
| *1.8. Assessment1 of Learning Outcomes* | | | | | | | | |
| Course attendance | 2 | Class participation |  | Seminar paper | |  | Experiment |  |
| Written exam |  | Oral exam | 1,5 | Essay | |  | Research |  |
| Project |  | Continuous Assessment | 2,5 | Presentation | |  | Practical work |  |
| Portfolio |  |  |  |  | |  |  |  |

1 **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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| *1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam* | | | | |
| Assessment of learning outcomes outcomes is done according to the Ordinance on Studies of the University of Rijeka and the Ordinance on Studying at the Faculty of Maritime Studies in Rijeka as follows:   * through continuous testing of knowledge during classes, 70% of acquired learning outcomes are evaluated through the 1st written exam - learning outcomes 1-6 (30%), the 2nd written exam - learning outcomes 6-8 (30%), and through regular class attendance (10 %) * At the final part of the exam, 30% of the acquired learning outcomes are evaluated (1-8), where the student must realize a minimum of 50% of points to pass the final exam.   Examples of evaluating learning outcomes in relation to set learning outcomes are:  WRITTEN EXAM:   1. There are 1000 dice in the box, all of which are correct, except for one, which has a six on all sides. Fortunately, one dice was drawn and thrown four times. All four times it dropped to number 6. What is the probability that it is a faulty dice? 2. The random variable X has a normal distribution with expectation EX = 3 and is valid P (X <5) = 0: 6915. Calculate the probability of event P (-1 <X <6) .l 3. Determine the zero point of the function f (x) = x2-2 / x with an accuracy of 0.005. 4. The function is given in the table:   x 0 1 2 3  f(x) 0,1232 0,3687 0,4587 0,6899  Using Simpson's formula with 2n = 6, determine the integral of the function f (x) on the segment [0,3].  ORAL EXAM:  1. The Total probability theorem  2. Approximation of the Binomial Distribution by the Normal Distribution  3. Iterative method for solving equations | | | | |
| *1.10. Main Reading* |  | |  | |
| 1. . Poganj: Teorija vjerojatnosti. Metodička zbirka riješenih ispitnih zadataka, Pomorski fakultet u Rijeci, 1997. 2. B. Draščić, T. Poganj, Primijenjena matematika, Pomorski fakultet u Rijeci, Sveučilište u Rijeci, Rijeka, 2010. (e-izdanje) | | | | |
| *1.11. Recommended Reading* |  | |  | |
| 1. N.V.Kopchenova, I.A.Maron: Computational mathematics, MIR Publishers, Moscow, 1972. 2. P. Vranjković: Zbirka zadataka iz vjerojatnosti i statistike, Školska knjiga, Zagreb, 1992. 3. W. Feller: An Introduction to Probability Theory and its Applications, I,II, J. Wiley & Sons, New York, 1950, 1966 | | | | |
| *1.12. Number of Main Reading Examples* |  | |  | |
| *Title* | *Number of examples* | | *Number of students* | |
| T. Poganj: Teorija vjerojatnosti. Metodička zbirka riješenih ispitnih zadataka, Pomorski fakultet u Rijeci, 1997. | | 35 | |  |
| B. Draščić, T. Poganj, Primijenjena matematika, Pomorski fakultet u Rijeci, Sveučilište u Rijeci, Rijeka, 2010. | | As needed | |  |
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| *1.13. Quality Assurance* | | | | |
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