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| **UČNI NAČRT PREDMETA / COURSE SYLLABUS** | | | | | | | | | | | | | | | | | |
| **Predmet:** | | | Uporabna statistika | | | | | | | | | | | | | | |
| **Course title:** | | | Applied Statistics | | | | | | | | | | | | | | |
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| **Študijski program in stopnja**  **Study programme and level** | | | | | **Študijska smer**  **Study field** | | | | | | | | **Letnik**  **Academic year** | | **Semester**  **Semester** | | |
| Podiplomski magistrski študijski program druge stopnje Elektrotehnika | | | | | Vse smeri | | | | | | | | 1 | | 1 | | |
| 2nd cycle masters study programme in Electrical Engineering | | | | | All study fields | | | | | | | | 1 | | 1 | | |
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| **Vrsta predmeta / Course type** | | | | | | | | | | | | Izbirni-splošni /elective general | | | | | |
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| **Univerzitetna koda predmeta / University course code:** | | | | | | | | | | | | 64257 | | | | | |
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| **Predavanja**  **Lectures** | **Seminar**  **Seminar** | | | **Vaje**  **Tutorial** | | | **Klinične vaje**  **work** | | | | **Druge oblike študija** | | | **Samost. delo**  **Individ. work** | |  | **ECTS** |
| **60** |  | | | **15** | | |  | | | |  | | | **75** | |  | **6** |
|  | | | | | | | | | | | | | | | | | |
| **Nosilec predmeta / Lecturer:** | | | | | Gregor Dolinar, Melita Hajdinjak | | | | | | | | | | | | |
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| **Jeziki /**  **Languages:** | | **Predavanja / Lectures:** | | | | **Slovenski in angleški /**  **Slovenian and English** | | | | | | | | | | | |
| **Vaje / Tutorial:** | | | | **Slovenski in angleški /**  **Slovenian and English** | | | | | | | | | | | |
| **Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:** | | | | | | | | |  | **Prerequisits:** | | | | | | | |
| Vpis v letnik. | | | | | | | | |  | Enrolment in the year of the course. | | | | | | | |
| **Vsebina:** | | | | | | | |  | | **Content (Syllabus outline):** | | | | | | | |
| Osnove verjetnostnega računa: kombinatorika (permutacije, kombinacije, ...), slučajne spremenljivke (diskretne, zvezne) in njihova porazdelitev (Gaussova, Poissonova, Weibullova, ...), številske karakteristike (matematično upanje, varianca).  Statistika: načrtovanje statističnega opazovanja (definicija hipoteze, ustrezna izbira vzorca in spremenljivk), predstavitev podatkov, ocenjevanje parametrov (definicija in lastnosti cenilke), preverjanje statističnih domnev (napaka I. in II. vrste), intervali zaupanja, testi (parametrični, neparametrični), regresija in korelacija (linearna, bivariatna, multivariatna), časovne vrste (ARIMA, ARCH), simulacije (metoda Monte Carlo). | | | | | | | |  | | Basic concepts of probability: combinatorics (permutations, combinations, …), random variables (discrete, continuous) and their distributions (Gauss, Poisson, Weibull, …), numerical characteristics (expected value, variance).  Statistics: statistic design (definition of statistical hypothesis, sampling plans), data presentation, estimation of parameters (definition and properties of estimators), hypothesis testing (type one and type two error), confidence intervals, tests (parametric, non-parametric), regression and correlation (linear, bivariate, multivariate), time series (ARIMA, ARCH), simulations (Monte Carlo method). | | | | | | | |

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| **Temeljni literatura in viri / Readings:** | | | | | |
| 1. D. C. Montgomery, G. C. Runger: Applied statistics and probability for engineers, John Wiley & Sons, 6th Edition, 2013. 2. W. C. Navidi: Statistics for Engineers and Scientists, McGraw-Hill, 2007. 3. G. Turk: Verjetnostni račun in statistika, Ljubljana, 2011. 4. M. Hladnik: Verjetnost in statistika, Založba FE in FRI, Ljubljana, 2002. 5. R.S. Kenett, S. Zacks, D. Amberti: Modern Industrial Statistics: with Applications in R, MINITAB, and JMP, Wiley 2014. | | | | | |
| **Cilji in kompetence:** | |  | | **Objectives and competences:** | |
| Osvojiti osnove verjetnostnega računa. Osvojiti osnovne statistične metode, med njimi razločevati in izbirati ter biti sposoben izdelati statistično analizo z vsebinsko razlago. Razvijati spretnost zbiranja in statistične interpretacije podatkov ter kritične analize rezultatov in meritev v tehniki. Osvojiti uporabo nekaterih programskih orodij za statistiko. | |  | | Grasp the basics of probability theory and statistical methods. Being able to collect and interpret statistical data and to make a critical analysis of the results and measurements in technical engineering with appropriately chosen statistical methods. Use of some statistical data analysis software. | |
| **Predvideni študijski rezultati:** | | |  | **Intended learning outcomes:** | |
| Poznavanje statističnih metod, ki so uporabne v tehniki, ločevati med njimi ter jih uporabljati pri statistični analizi z ustreznimi statističnimi programskimi paketi. | | |  | Become familiar with statistical methods used in technical engineering, being able to distinguish among them, being able to make a statistical analysis with the help of appropriate statistical software packages. | |
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| **Metode poučevanja in učenja:** | | |  | **Learning and teaching methods:** | |
| Predavanja, laboratorijske vaje, domače naloge, seminarska naloga. | | |  | Lectures, laboratory work, homeworks, seminar assignment. | |
| **Načini ocenjevanja:** | Delež (v %) /  Weight (in %) | | | | **Assessment:** |
| Načini:  - domače naloge,  - seminarska naloga,  - ustni izpit.  Ocenjevalna lestvica:  negativno (od 1 do 5),  pozitivno (od 6 do 10).  Pozitivni oceni domačih nalog in seminarske naloge sta pogoja za pristop k ustnemu izpitu. Pozitivna ocena na ustnem izpitu je pogoj za skupno pozitivno oceno.  Prispevki k oceni:  - domače naloge  - seminarska naloga,  - ustni izpit. | 25  50  25 | | | | Types:  - homework assignments,  - seminar assignment,  - oral exam.  Grading scale:  negative (1-5),  positive (6-10).  Positive grades of the homework assignments and the seminar assignment are prerequisites for the oral exam. Positive grade at the oral exam is a prerequisite for a positive final grade.  Contributions to the final grade:  - homework assignments,  - seminar assignment,  - oral exam. |
| **Reference nosilca / Lecturer's references:** | | | | | |
| **Prof. dr. Gregor Dolinar**   1. DOLINAR, Gregor, KUZMA, Bojan, NAGY, Gergő, SZOKOL, Patrícia. Restricted skew-morphisms on matrix algebras. *Linear Algebra and its Applications*, ISSN 0024-3795, 2016, vol. 490, str. 1-17. 2. DOLINAR, Gregor, GUTERMAN, Aleksandr Èmilevič, MAROVT, Janko. Monotone transformations on B(H) with respect to the left-star and the right-star partial order. *Mathematical inequalities & applications*, ISSN 1331-4343, 2014, vol. 17, no. 2, str. 573-589. 3. DOLINAR, Gregor, MOLNÁR, Lajos. Isometries of the space of distribution functions with respect to the Kolmogorov-Smirnov metric. *J. math. anal. appl.*, 2008, letn. 348, št. 1, str. 494-498. 4. MAREŠ, Tomáš, DANIEL, Matej, PERUTKOVÁ, Šárka, PERNE, Andrej, DOLINAR, Gregor, IGLIČ, Aleš, RAPPOLT, Michael, KRALJ-IGLIČ, Veronika. Role of phospholipid asymmetry in the stability of inverted hexagonal mesoscopic phases. *J. phys. chem., B Condens. mater. surf. interfaces biophys.*, 2008, letn. 112, št. 51, str. 16575-16584. 5. ŠKERLJ, Tina, DOLINAR, Gregor, MRAMOR, Dušan. Estimation of asset accumulation of the proposed Slovenian mandatory-funded pension pillar. *Acta oecon. (Bp.)*, 2001, letn. 51, št. 4, str. 513-539.   **Doc. ddr. Melita Hajdinjak**   1. SULIĆ KENK, Vildana, MANDELJC, Rok, KOVAČIČ, Stanislav, KRISTAN, Matej, HAJDINJAK, Melita, PERŠ, Janez. Visual re-identification across large, distributed camera networks. *Image and vision computing*, ISSN 0262-8856, Feb. 2015, vol. 34, str. 11-26. 2. VODOPIVEC, Samo, HAJDINJAK, Melita, BEŠTER, Janez, KOS, Andrej. Vehicle interconnection metric and clustering protocol for improved connectivity in vehicular ad hoc networks. *EURASIP Journal on wireless communications and networking*, ISSN 1687-1499, 2014, 2014, 170, str. 1-14. 3. RUGELJ, Miha, SEDLAR, Urban, VOLK, Mojca, STERLE, Janez, HAJDINJAK, Melita, KOS, Andrej. Novel cross-layer QoE-aware radio resource allocation algorithms in multiuser OFDMA systems. *IEEE transactions on communications*, ISSN 0090-6778, Sep. 2014, vol. 62, no. 9, str. 3196-3208. 4. HAJDINJAK, Melita, BIERMAN, Gavin M. Extending relational algebra with similarities. *Mathematical structures in computer science*, ISSN 0960-1295, Aug. 2012, vol. 22, no. 4, str. 686-718. 5. HAJDINJAK, Melita, MIHELIČ, France. The PARADISE evaluation framework : issues and findings. *Computational linguistics*, ISSN 0891-2017, Jun. 2006, vol. 32, iss. 2, str. 263-272. | | | | | |