| UČNI NAČRT PREDMETA / COURSE SYLLABUS (leto / year 2017/18) | | | |
|---|---|---|---|
| **Predmet:** | Verjetnostni račun in statistika | | |
| **Course title:** | Probability and statistics | | |

| Študijski program in stopnja<br>Study programme and level | Študijska smer<br>Study field | Letnik<br>Academic year | Semester<br>Semester |
|---|---|---|---|
| Interdisciplinarni univerzitetni študijski program Računalništvo in matematika | ni smeri | 3 | prvi in drugi |
| Interdisciplinary first cycle academic study programme Computer Science and Mathematics | none | 3 | first and second |

| Vrsta predmeta / Course type | obvezni / compulsory |
|---|---|

| Univerzitetna koda predmeta / University course code: | 27216 |
|---|---|

| Predavanja<br>Lectures | Seminar<br>Seminar | Vaje<br>Tutorial | Klinične vaje<br>work | Druge oblike študija | Samost. delo<br>Individ. work | | ECTS |
|---|---|---|---|---|---|---|---|
| 60 | | 60 | | | 180 | | 10 |

| Nosilec predmeta / Lecturer: | prof. dr. Roman Drnovšek, prof. dr. Mihael Perman |
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| Jeziki /<br>Languages: | Predavanja /<br>Lectures: | slovenski / Slovene |
|---|---|---|
| | Vaje / Tutorial: | slovenski / Slovene |

| Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti: | Prerequisites: |
|---|---|
| Vpis v letnik študija.<br><br>Opravljena predmeta Analiza 1 in Analiza 2. | Enrolment in the programme.<br><br>Completed courses Analysis 1 and Analysis 2. |

| Vsebina: | Content (Syllabus outline): |
|---|---|

| | |
|---|---|
| definicija verjetnosti | definition of probability |
| pogojna verjetnost | conditional probability |
| slučajne spremenljivke in vektorji | random variables and vectors |
| diskretne in zvezne porazdelitve | discrete and continuous distributions |
| matematično upanje | expectation |
| disperzija, kovarianca in korelacijski koeficient | variance, covariance and correlation coefficient |
| višji momenti in vrstilne karakteristike | higher moments and order statistics |
| pogojna porazdelitev in pogojno matematično upanje | conditional distribution and conditional expectation |
| rodovne funkcije, momentno rodovne funkcije | generating functions, moment-generating functions |
| zakoni velikih števil | laws of large numbers |
| centralni limitni izrek | central limit theorem |
| uvod v statistiko | introduction to statistics |
| vzorčne statistike in cenilke | sample statistics and estimators |
| intervali zaupanja | confidence intervals |
| testiranje statističnih hipotez | testing statistical hypotheses |
| linearna regresija | linear regression |
| prilagoditveni testi | goodness of fit tests |
| neparametrični testi | nonparametric tests |

**Temeljni literatura in viri / Readings:**

Hladnik M.: Verjetnost in statistika, Založba FE in FRI, Ljubljana, 2002, ISBN: 961-6209-34-5, 140 str.

Jamnik R.: Matematična statistika, DZS Ljubljana, 1980, 408 str.

Jamnik R.: Verjetnostni račun in statistika, DMFA Slovenije, Ljubljana, 1986, 156 str.

Grimmett G. R., Stirzaker D. R.: Probability and random processes, Second edition, The Clarendon

Press, Oxford University Press, New York, 1992, 541 str.

**Cilji in kompetence:**

Predstaviti osnove teorije verjetnosti in njeno uporabo v statistiki.

**Objectives and competences:**

Introduction to probability theory and its applications in statistics.

**Predvideni študijski rezultati:**

Razumevanje teoretičnih konceptov v številnih primerih uporabe. Zmožnost razpoznavanja verjetnostnih in statističnih vsebin v drugih vedah (fizika, ekonomija, finance, aktuarstvo, medicina, biologija, industrijska statistika).

**Intended learning outcomes:**

Understanding of theoretical concepts in various applications. The ability to recognize probabilistic and statistical concepts in other sciences (physics, economics, finance, actuarial science, medicine, biology, industrial statistics).

**Metode poučevanja in učenja:**

Predavanja, vaje, domače naloge.

**Learning and teaching methods:**

Lectures, exercises, homeworks.

| **Načini ocenjevanja:** | Delež (v %) / Weight (in %) | **Assessment:** |
|---|---|---|
| pisni izpit, teoretični test ali ustni izpit | | written examination, theoretical test or oral exam |

**Reference nosilca / Lecturer's references:**

Roman Drnovšek:

DRNOVŠEK, Roman. Triangularizing semigroups of positive operators on an atomic normed Riesz

space. Proceedings of the Edinburgh Mathematical Society, ISSN 0013-0915, 2000, let. 43, št. 1, str. 43-55. [COBISS.SI-ID 9480281]

DRNOVŠEK, Roman. Common invariant subspaces for collections of operators. Integral equations and operator theory, ISSN 0378-620X, 2001, vol. 39, no. 3, str. 253-266. [COBISS.SI-ID 10597721]

DRNOVŠEK, Roman. An infinite-dimensional generalization of Zenger's lemma. Journal of mathematical analysis and applications, ISSN 0022-247X. [Print ed.], 2012, vol. 388, iss. 2, str. 1233-1238. [COBISS.SI-ID 16214617]

Mihael Perman:

PERMAN, Mihael, WELLNER, Jon A. On the distribution of Brownian areas. Annals of applied probability, ISSN 1050-5164, 1996, let. 6, št. 4, str. 1091-1111. [COBISS.SI-ID 7101017]

PERMAN, Mihael, SENEGAČNIK, Andrej, TUMA, Matija. Semi-Markov models with an application to power-plant reliability analysis. IEEE transactions on reliability, ISSN 0018-9529, 1997, vol. 46, no. 4, str. 526-532. [COBISS.SI-ID 2567707]

PERMAN, Mihael, PITMAN, Jim, YOR, Marc. Size-biased sampling of Poisson processes and excursions. Probability theory and related fields, ISSN 0178-8051, 1992, 92, no. 1, str. 21-39. [COBISS.SI-ID 12236377]