

**UČNI NAČRT PREDMETA / COURSE SYLLABUS**

|                      |                        |
|----------------------|------------------------|
| <b>Ime predmeta:</b> | MATEMATIČNE METODE 2   |
| <b>Course title:</b> | MATHEMATICAL METHODS 2 |

| Študijski program in stopnja<br>Study programme and cycle | Študijska smer<br>Study option | Letnik<br>Year of study | Semester<br>Semester |
|---|--------------------------------|-------------------------|----------------------|
| LOGISTIKA SISTEMOV 1. stopnja                             |                                | 2.                      | 3.                   |
| SYSTEM LOGISTICS 1 <sup>st</sup> degree                   |                                | 2.                      | 3.                   |

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| <b>Vrsta predmeta (obvezni ali izbirni) /<br/>Course type (compulsory or elective)</b> | OBVEZNI    |
|  | COMPULSORY |

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|--|----|
| <b>Univerzitetna koda predmeta / University course code:</b> | UN |
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| Predavanja<br>Lectures | Seminar<br>Seminar | Vaje<br>Tutorial | Klinične vaje<br>Clinical training | Druge oblike študija<br>Other forms of study | Samost. delo<br>Individual work | ECTS |
|------------------------|--------------------|------------------|------------------------------------|--|---------------------------------|------|
| 36 a-P<br>24 e-P       |                    | 18 e-V<br>27 a-V |                                    |  | 135                             | 8    |

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| <b>Nosilec predmeta / Course coordinator:</b> | MAJA FOŠNER |
|---|-------------|

|                           |                               |                   |
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| <b>Jeziki /Languages:</b> | <b>Predavanja / Lectures:</b> | SLOVENSKI/SLOVENE |
|                           | <b>Vaje / Tutorial:</b>       | SLOVENSKI/SLOVENE |

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|--|---|
| <b>Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:</b> | <b>Prerequisites for enrolling in the course or for performing study obligations:</b> |
| Ni pogojev.  | None.   |

| <b>Vsebina (kratek pregled učnega načrta):</b>   | <b>Content (syllabus outline):</b>   |
|--|--|
| <ul style="list-style-type: none"> <li>▪ Diferencialni račun: odvod funkcije, geometrijski pomen odvoda, pravila za odvajanje, odvodi elementarnih funkcij, diferencial, višji odvodi, Taylorjeva formula, uporaba odvoda (ekstremi, prevoji, optimizacijske naloge).</li> <li>▪ Nedoločeni integral: definicija, pravila za integriranje, vpeljava nove spremenljivke, delno integriranje, integriranje racionalnih funkcij, primeri.</li> <li>▪ Določeni integral: definicija določenega integrala, geometrijski pomen in lastnosti, računanje, uporaba in primeri.</li> <li>▪ Dvojni, trojni integral.</li> <li>▪ Diferencialne enačbe: osnovni pojmi, diferencialne enačbe prvega reda, diferencialne enačbe drugega reda, primeri.</li> </ul> | <ul style="list-style-type: none"> <li>▪ Differential calculus: the derivative of a function, geometrical importance of a derivative, derivation rules, derivatives of elementary functions, a differential, higher order derivatives, Taylor's formula, application of a derivative (extremes, inflection points).</li> <li>▪ Indefinite integral: definition, integration rules, introduction of a new variable, partial integration, integration of rational functions, application and examples.</li> <li>▪ Double, triple integrals.</li> <li>▪ Differential equations: basic terminology, first order differential equations, second order differential equations, examples.</li> <li>▪ Functions of more variables: examples, partial derivatives, Taylor's formula, application examples.</li> </ul> |

- Funkcije več spremenljivk: primeri, parcialni odvodi, Taylorjeva formula, primeri uporabe.

### Temeljni literatura in viri / Reading materials:

E-gradivo predmeta.

FOŠNER, Maja. *Matematične metode : elektronski učbenik*. Celje: Fakulteta za logistiko, 2009. 1 optični disk (CD-ROM). ISBN 978-961-6562-29-4.

FOŠNER, Maja, MARCEN, Benjamin. *Zbirka nalog iz matematičnih metod 2*. Celje; Krško: Univerza v Mariboru, Fakulteta za logistiko, 2012. 133 str., ilustr. ISBN 978-961-6562-52-2.

[http://fl.uni-mb.si/attachments/zbirka\\_nalog\\_MM2\\_Fosner\\_Marcen.pdf](http://fl.uni-mb.si/attachments/zbirka_nalog_MM2_Fosner_Marcen.pdf).

Dodatna literatura:

Jamnik J.: Matematika, Ljubljana, Društvo matematikov, fizikov in astronomov, Ljubljana, 1990, ISBN. 961-212-034-X, COBISS.SI-ID 43443968.

Vidav, I.: Višja matematika I, Ljubljana: Društvo matematikov, fizikov in astronomov Slovenije, 1994 ISBN: 961-212-031-5 COBISS.SI-ID:40515072.

Vidav, I.: Višja matematika II, Ljubljana: Društvo matematikov, fizikov in astronomov Slovenije, 1994, COBISS.SI-ID: 146945.

Usenik, J.: Matematične metode v prometu, UL FPP, 1998, ISBN 961-6044-31-1 COBISS.SI-ID: 75814400.

### Cilji in kompetence:

Študenti spoznajo in osvojijo pojme matematične analize, se naučijo natančnosti izražanja, pisanja in razmišljanja.

Cilj: kritično razmišljanje in uporaba teoretičnega znanja v konkretnih primerih in iskanju rešitev problemov ter njihove realizacije na področju logistike.

### Objectives and competences:

Students are familiarised with and grasp the concepts of mathematical analysis and probability calculus, they learn to think, write and express themselves accurately and they gain the ability to apply their theoretical knowledge in practice in logistics.

Goal: critically thinking and use theoretical knowledge in concrete cases, and find solutions to problems and their realization in the field of logistics.

### Predvideni študijski rezultati:

- Sposobnost obvladanja standardnih metod in postopkov matematične analize.
- Sposobnost uporabe pridobljenega teoretičnega znanja v praksi.
- Avtonomnost v svojem strokovnem delu.

Pridobljeno teoretično in aplikativno znanje imajo študenti možnost uporabiti pri znanstveno raziskovalnem delu, pri nadgradnji naravoslovnih vsebin na 2. stopnji oziroma pri zaposlitvi.

### Intended learning outcomes:

- The ability to master standard methods and procedures of mathematical analysis.
- The ability to use the acquired theoretical knowledge in practice.
- Independence in professional work.

Students acquire the theoretical and applicative knowledge in the field of scientific research, upgrading natural sciences at the second level, or employment.

### Metode poučevanja in učenja:

Predavanja: pri predavanjih študent spozna teoretične vsebine predmeta. Del predavanj se izvaja na klasični način v predavalnici, del pa v obliki e-predavanj (e-predavanja se lahko izvajajo na videokonferenčni način ali s pomočjo posebej v ta

### Learning and teaching methods:

Lectures: students understand the theoretical frameworks of the course. Part of the lecture course is in a classroom while the rest is in the form of e-learning (e-lectures may be given via video-

namen didaktično pripravljenih e-gradiv v virtualnem elektronskem učnem okolju).

Vaje: pri vajah študent utrdi teoretično znanje in spozna aplikativne možnosti. Del vaj se izvaja na klasični način v predavalnici, del pa v obliki e-vaj (e-vaje se lahko izvajajo na videokonferenčni način ali s pomočjo posebej v ta namen didaktično pripravljenih e-gradiv v virtualnem elektronskem učnem okolju).

conferencing or with the help of specially designed e-material in a virtual electronic learning environment).

Tutorials: Students enhance their theoretical knowledge and are able to apply it. Part of the seminar is in a classroom while the rest is in the form of e-learning (e-tutorials may be given via video-conferencing or with the help of specially designed e-material in a virtual electronic learning environment).

| Načini ocenjevanja:  | Delež (v %) /<br>Share (in %) | Assessment methods:  |
|--|-------------------------------|--|
| Opravljene obveznosti e-predavanj in e-vaj so pogoj za pristop k izpitu. |                               | Successful completion of e-lectures and e-tutorials is a prerequisite for entering the exam. |
| Pisni izpit (računski del).  | 80%                           | Written examination (calculation part).  |
| Pisni del (teorija).   | 20%                           | Oral examination (theory).   |

#### Reference nosilca / Course coordinator's references:

1. FOŠNER, Maja, MARCEN, Benjamin, VUKMAN, Joso. On functional equation related to  $(m, n)$ -Jordan centralizers in prime rings. *Bulletin of the Malaysian mathematical sciences society*, ISSN 2180-4206, 2018, str. [1-17]. [https://link.springer.com/article/10.1007/s40840-018-0650-9?wt\\_mc=Internal.Event.1.SEM.ArticleAuthorOnlineFirst](https://link.springer.com/article/10.1007/s40840-018-0650-9?wt_mc=Internal.Event.1.SEM.ArticleAuthorOnlineFirst), doi: [10.1007/2Fs40840-018-0650-9](https://doi.org/10.1007/2Fs40840-018-0650-9). [COBISS.SI-ID [512927037](https://www.cobiss.si/id/512927037)].
2. FOŠNER, Maja, MARCEN, Benjamin, VUKMAN, Joso. On functional equation related to a class of generalized inner derivations in prime rings. *Bulletin of the Malaysian Mathematical Society*, ISSN 0126-6705, 2018, vol. 41, iss. 2, str. 687-707, doi: [10.1007/s40840-016-0341-3](https://doi.org/10.1007/s40840-016-0341-3). [COBISS.SI-ID [22067208](https://www.cobiss.si/id/22067208)].
3. FOŠNER, Maja, MARCEN, Benjamin, VUKMAN, Joso. A result in the spirit of Herstein theorem. *Glasnik matematički. Serija 3*, ISSN 0017-095X, 2018, vol. 53, no. 1, str. 73-95. <http://dx.doi.org/10.3336/gm.53.1.06>, doi: [10.3336/gm.53.1.06](https://doi.org/10.3336/gm.53.1.06). [COBISS.SI-ID [18389081](https://www.cobiss.si/id/18389081)].
4. FOŠNER, Maja, MARCEN, Benjamin, VUKMAN, Joso. A result in the spirit of Herstein theorem. *Glasnik matematički*, ISSN 1846-7989, 2018, vol. 53, no. 1, str. 73-95. [https://web.math.pmf.unizg.hr/glasnik/53.1/53\(1\)-06.pdf](https://web.math.pmf.unizg.hr/glasnik/53.1/53(1)-06.pdf). [COBISS.SI-ID [512926525](https://www.cobiss.si/id/512926525)].
5. FOŠNER, Maja, MARCEN, Benjamin, VUKMAN, Joso. On some functional equation arising from  $(m, n)$ -Jordan derivations of prime rings. *Publicationes mathematicae*, ISSN 2064-2849. [Online ed.], 2018, vol. 92, iss. 1/2, str. 133-146. [http://publi.math.unideb.hu/load\\_jpg.php?p=2198](http://publi.math.unideb.hu/load_jpg.php?p=2198), doi: [10.5486/PMD.2018.7780](https://doi.org/10.5486/PMD.2018.7780). [COBISS.SI-ID [512895549](https://www.cobiss.si/id/512895549)].
6. FOŠNER, Maja, REHMAN, Nadeem Ur, BANO, Tarannum. A note on generalized derivations on prime rings. *Arabian journal of mathematics*, ISSN 2193-5351, 2017, str. [1-5]. <https://link.springer.com/content/pdf/10.1007/2Fs40065-017-0193-1.pdf>, doi: [10.1007/s40065-017-0193-1](https://doi.org/10.1007/s40065-017-0193-1). [COBISS.SI-ID [512895293](https://www.cobiss.si/id/512895293)].
7. FOŠNER, Maja, ŠIROVNIK, Nejc, VUKMAN, Joso. A result related to Herstein theorem. *Bulletin of the Malaysian Mathematical Society*, ISSN 0126-6705, Jul. 2016, vol. 39, iss. 3, 885-899 str. <http://link.springer.com/article/10.1007/s40840-015-0196-z>, doi: [10.1007/s40840-015-0196-z](https://doi.org/10.1007/s40840-015-0196-z). [COBISS.SI-ID [512695869](https://www.cobiss.si/id/512695869)].
8. FOŠNER, Maja, MARCEN, Benjamin, REHMAN, Nadeem Ur. On skew-commuting mappings in semiprime rings. *Mathematica slovacica*, ISSN 1337-2211, Avg. 2016, vol. 66, iss. 4, str. 811-814. <https://doi.org/10.1515/ms-2015-0183>, doi: [10.1515/ms-2015-0183](https://doi.org/10.1515/ms-2015-0183). [COBISS.SI-ID [512822589](https://www.cobiss.si/id/512822589)].

9. FOŠNER, Maja. A result concerning additive mappings in semiprime rings. *Mathematica slovacca*, ISSN 0139-9918, Dec. 2015, vol. 65, iss. 6, str. 1271-1276. <http://www.degruyter.com/view/j/ms.2015.65.issue-6/ms-2015-0088/ms-2015-0088.xml?format=INT>, doi: [10.1515/ms-2015-0088](https://doi.org/10.1515/ms-2015-0088). [COBISS.SI-ID [512753213](https://www.cobiss.si/id/512753213)].