

**UČNI NAČRT PREDMETA / COURSE SYLLABUS**

**Predmet:** Uvod v znanstveno-raziskovalno delo  
**Course title:** Introduction to Scientific Research

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Informacijske znanosti, doktorski študijski program tretje stopnje	Obe smeri	Prvi	Prvi in drugi
Information sciences, third cycle Doctoral Study Programme	Both fields	First	First and second

**Vrsta predmeta / Course type**

Obvezni / Mandatory

**Univerzitetna koda predmeta / University course code:**

1-IZ-DR-UZRD-2025-01-29

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
25	5	/	/	/	270	10

**Nosilec predmeta / Lecturer:** izr. prof. dr. Zoran Levnajić

**Jeziki / Languages:** **Predavanja / Lectures:** Slovenski / Slovenian, Angleški / English  
**Vaje / Tutorial:**

**Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:**

Vpis v prvi letnik študija.

**Prerequisites:**

Enrollment in the first year of studies.

**Vsebina:**

Končni cilj predmeta je osmišljena, napisana ter predstavljena dispozicija doktorske disertacije. Predmet je namenjen temu, da študent pripravi in predstavi raziskovalni plan svoje doktorske naloge, ki bo oddan fakulteti za potrditev. Osnutke dispozicij študenti predstavijo svojim kolegom. Študenti dobijo priložnost, da medsebojno kolegialno ocenjujejo drug drugega in prejmejo sugestije. Na podlagi navedenega, študent pripravi in odda končno verzijo dispozicije.

**Content (Syllabus outline):**

The ultimate goal of this course is a well written and publicly presented dissertation proposal. This course helps to the student prepare and present his/her doctoral research plan, which is to be confirmed by the faculty. The draft is to be presented in front of other students (peers). Students will have the chance to interact as peers and assess each other. Based on the above, the student prepares the final version of the dissertation proposal and officially submits it to the faculty.

Vzporedno s tem študenti spoznavajo znanstveno raziskovanje in druga širša vprašanja v zvezi z doktorskim študijem:

- Primeri znanstvenih raziskav v vsakdanjem življenju. Primeri aktualnih znanstvenih raziskav.
- Raziskave usmerjene k odkritjem v primerjavi z metodološkimi raziskavami.
- Različne sheme raziskav.
- Kaj je dober raziskovalni problem in kaj ne? Kako izbrati doktorsko temo? Kako izbrati mentorja?
- Zbiranje in branje znanstvene literature. Kako in kaj brati?
- Formalizacija in artikulacija raziskovalnega problema. Kako na literaturi utemeljiti en raziskovalni problem?
- Kako rešujemo raziskovalne naloge: znanstvena metodologija.
- Glavne raziskovalne metode
- Kaj je "metoda" za metodološki doktorat?
- Predstavitev rezultatov. Zakaj jih predstavljamo? Komu? Kako?
- Znanstveno pisanje. Slog in jezik.
- Kako napisati (tradicionalni) raziskovalni članek? Standardna struktura IMRaD.
- Kako napisati metodološki članek?
- Kako oddati članek? Življenjski cikel znanstvenega prispevka.
- Znanstvene revije. Razvrstitev revij, faktor vpliva.
- Mednarodne znanstvene konference.
- Financiranje raziskav. Kako napisati raziskovalni predlog (prijavo)?
- Kako napisati dispozicijo? Kako jo predstaviti? Dispozicija kot raziskovalna prijava.
- Kolegialne recenzije. Kako oceniti delo drugih ljudi? Koliko kritik je zaželeno?

In parallel to this, students learn about scientific research and other broad topic regarding their doctoral studies:

- Examples of research in everyday life. Examples of actual scientific research.
- Discovery-driven vs. Methodological research.
- Various schemes of research.
- What is a good research problem and what is not? How to choose the doctoral topic? How to choose an adviser?
- Collecting and reading scientific literature. How and what to read?
- Formalizing and articulating a research problem. How to motivate a research problem on pertaining literature?
- How do we solve research problems: scientific methodology.
- Main research methods
- What is "the method" for a methodological doctorate?
- Presenting research results. Why are we presenting them? To whom? How?
- Scientific writing. Style and language.
- How to write a (traditional) research paper? Standard IMRaD structure.
- How to write a methodological paper?
- How to submit a paper? Life-cycle of a scientific manuscript.
- Scientific journals. Ranking of journals, impact factor.
- International scientific conferences.
- Research financing. How to write a research proposal (application)?
- How to write a dissertation proposal? How to present it?
- Peer-reviewing. How to review others' work? How much criticism is adequate?

### Temeljni literatura in viri / Readings:

- Phillips, E., Johnson, C. (2022). *How to Get a PhD: a Handbook for Students and Their Supervisors*. McGraw-Hill Education.
- Gosling, P., Noordam, B. (2022). *Mastering Your PhD Survival and Success in the Doctoral Years and Beyond*. Springer.
- Brown, G. (2021). *How to Get Your PhD: A Handbook for the Journey*. Oxford University Press.
- Primeri zaključenih doktorskih disertacij in potrjenih dispozicij / Examples of past dissertations and approved dissertation proposals

**Cilji in kompetence:**

*Učna enota prispeva k razvoju naslednjih splošnih kompetenc:*

- Sposobnost identificiranja danega raziskovalnega problema, njegove analize, ovrednotenja ter oblikovanja možnih rešitev. Sposobnost samostojnega raziskovalno-razvojnega dela in vodenje raziskovalne skupine.
- Prizadevanje za kakovost znanstveno-raziskovalnega dela skozi avtonomnost, (samo)kritičnost, (samo)refleksivnost in (samo)evalviranje. Zavezanost profesionalni etiki.

*in predmetno-specifičnih kompetenc:*

- Sposobnost identifikacije relevantnega raziskovalnega znanstvenega problema in priprava raziskovalnega načrta doktorske raziskave.
- Spretnost v znanstvenem pisanju in predstavitvi rezultatov na svojem raziskovalnem področju.
- Razumevanje dinamike znanstveneg dela in publiciranja na mednarodnem nivoju.

**Objectives and competences:**

*Learning unit contributes to development of the following general competencies:*

- Ability to identify a given research problem, analyse it, evaluate it and formulate possible solutions.
- Ability for independent research-development work and leadership of a research group.
- Striving for quality in scientific research through autonomy, (self-)criticism, (self)reflexivity and (self-)evaluation. Commitment to professional ethics.

*and subject-specific competencies:*

- The ability to identify a relevant scientific research problem and to prepare a research plan for doctoral research.
- Skills in scientific writing and the ability to present obtained results in the relevant research field.
- Understanding the dynamics of scientific work and publishing at the international level.

**Predvideni študijski rezultati:**

Znanje in razumevanje:

*Študent/študentka:*

- je sposoben/na ustvariti svojo dispozicijo in oceniti njeno znanstveno odmevnost,
- formulira osnutek dispozicije in jo oblikuje do končne verzije,
- jasneje oceni preostanek svojega doktorskega študija,
- se seznanj z načini kako deluje znanstveno raziskovanje in objavljanje.

**Intended learning outcomes:**

Knowledge and understanding:

*The student:*

- is able to create his/her dissertation proposal and evaluate its scientific relevance,
- formulates the draft of the dissertation proposal and revises it until the final version,
- clearly assesses the rest of his/her doctoral studies,
- becomes familiar with the ways scientific research and publishing works.

**Metode poučevanja in učenja:****Learning and teaching methods:**

<ul style="list-style-type: none"> <li>• Predavanja z aktivno udeležbo študentov (razlaga, diskusija, vprašanja, primeri).</li> <li>• Individualno in seminarско delo (javna predstavitev).</li> </ul>	<ul style="list-style-type: none"> <li>• Lectures with active participation of students (explanation, discussion, questions, examples).</li> <li>• Individual and seminar work (public talk).</li> </ul>
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**Načini ocenjevanja:**

Delež (v %) /  
Weight (in  
%)

**Assessment:**

<p>Način (pisni izpit, ustno izpraševanje, naloge, projekt):</p> <ul style="list-style-type: none"> <li>• Krajši izpit oz. predstavitev dispozicije (Opomba: Vsebinski vidiki dispozicije se ocenjujejo izven predmeta.)</li> </ul>	100	<p>Type (examination, oral, coursework, project):</p> <ul style="list-style-type: none"> <li>• Short exam / presentation of the doctoral dissertation proposal (Note: The content aspects of the dissertation proposal are assessed outside the course.)</li> </ul>
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**Reference nosilca / Lecturer's references:**

<ul style="list-style-type: none"> <li>• Damij, N., Levnajić, Z., Modic, D., Suklan, J. (2023). Challenges and Limitations of Pandemic Information Systems: A Literature Review. <i>IEEE Transactions on Engineering Management</i>, (99), 1–17. doi: 10.1109/TEM.2023.3328894</li> <li>• Joksimović, J., Perc, M., Levnajić, Z. (2023). Self-organization in Slovenian public spending. <i>Journal of the Royal Society Open Science</i>, 10, 221279.</li> <li>• Jović, M., Šubelj, L., Golob, T., Makarovič, M., Yasseri, T., Boberić Krstičev, D., Škrbić, S., &amp; Levnajić, Z. (2023). Terrorist attacks sharpen the binary perception of “Us” vs. “Them”. <i>Scientific reports</i>, 1(12451), 1–14. doi.org/10.1038/s41598-023-39035-3</li> <li>• Crnkić, A., Povh, J., Jaćimović, V., &amp; Levnajić, Z. (2020). Collective dynamics of phase-repulsive oscillators solves graph coloring problem. <i>Chaos</i>, 30(3), 033128. doi.org/10.1063/1.5127794</li> <li>• Zorko, A., Frühwirth, M., Goswami, N., Moser, M., &amp; Levnajić, Z. (2020). Heart Rhythm Analyzed via Shapelets Distinguishes Sleep From Awake, <i>Frontiers in Physiology</i>, 10, 1554. doi.org/10.3389/fphys.2019.01554</li> </ul>
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