OBVEZNE VSEBINE

Univerza v Mariboru

Filozofska fakulteta

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Nevropsihologija
Course title:	Neuropsychology

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Vedenjska in kognitivna nevroznanost, 3. stopnja		**1.**	**1.**
Behavioral and Cognitive Neuroscience, 3rd Degree		**1.**	**1.**

Vrsta predmeta / Course type obvezni/obligatory

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
30	**30**				**240**	**10**

Nosilec predmeta / Lecturer: Norbert Jaušovec

Jeziki / Languages:	
Predavanja / Lectures:	Slovenščina/Slovene
Vaje / Tutorial:	Slovenščina/Slovene

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

Pogoji za vključitev v delo: Pogojev ni.

Prerequisites:

Prerequisites for attending the course: None.

Vsebina:

Pregled tehnik nevrološkega slikanja:

- Magnetna resonanca (MRI in fMRI)
- Pozitronska emisijska tomografija (PET)
- Blizuinfrardeča spektroskopija (NIRS in fNIRS)
- Elektroencefalogram (EEG)

Uporaba EEG in NIRS; Časovna in frekvenčna analiza EEG – ERP in ERD. Analiza izvorov – analiza dipolov, LORETA.
karakteristike in psihopatološke znake.

Content (Syllabus outline):

An overview of neuroimaging techniques and analysis methods:

- Magnetic resonance (MRI and fMRI)
- Positron emission tomography (PET)
- Near infrared spectroscopy (NIRS and fNIRS)
- Electroencephalogram (EEG)

Temeljni literatura in viri / Readings:

Kolb, B. & Whishaw, I.Q. (2003), Fundamentals of human Neuropsychology,(5. ed.) W.H. Freeman and Company , New York
Gruszka, A., Matthews, G., & Szymura, B. (2010). Handbook of individual differences in cognition: attention, memory, and executive control. New York: Springer.

Cilji in kompetence:	**Objectives and competences:**
Seznaniti študente z različnimi tehnikami možganskega slikanja in jih naučiti uporabiti neinvazivni tehniki EEG in NIRS. Študente naučiti različnih analiz EEG vzorcev in ERP. Seznaniti jih z novejšimi ugotovitvami v razlikah v delovanju možganov glede na različne vedenjske in psihopatološke vzorce	Students are introduced to different neuroimaging techniques, they are trained in the use of EEG and NIRS. They can read different EEG and ERP outputs and understand their meanings. Students are introduced to new findings related to brain functioning in relation to different behavioral and psychopathological patterns

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: Študenti ločijo med različnimi tehnikami možganskega slikanja, znajo interpretirati EEG vzorce in NIRS podatke. Poznajo različne ugotovitve o delovanju možganov v odvisnosti od psihopatoloških in osebnostnih karakteristikah	Knowledge and Understanding: The students distinguish between different neuroimaging techniques, they can interpret different EEG outputs and patterns and NIRS data. They have a detailed picture of brain functioning in relation to psychopathology and personality.

Metode poučevanja in učenja:	**Learning and teaching methods:**
Problemsko zastavljene enote, elementi E-učenja, frontalna oblika poučevanja, eksperimentalne vaje	Learning by discovery, E-learning, frontal methods of learning, laboratory work

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
pisni izpit	100	examination

Reference nosilca / Lecturer's references:

JAUŠOVEC, Norbert, JAUŠOVEC, Ksenija. Increasing working memory capacity with theta transcranial alternating current stimulation (tACS). Biological psychology, ISSN 0301-0511. [Print ed.], 2014, 96, str. 42-47, ilustr., doi: 10.1016/j.biopsycho.2013.11.006.

PAHOR, Anja, JAUŠOVEC, Norbert. Theta-gamma cross-frequency coupling relates to the level of human intelligence. Intelligence, ISSN 0160-2896. [Print ed.], sep./okt. 2014, vol. 46, str. 283-290, ilustr., doi: 10.1016/j.intell.2014.06.007.

JAUŠOVEC, Norbert, JAUŠOVEC, Ksenija. Working memory training : improving intelligence - changing brain activity. Brain and cognition, ISSN 0278-2626, 2012, vol. 79, iss. 2, str. 96-106, ilustr., doi: 10.1016/j.bandc.2012.02.007.

JAUŠOVEC, Norbert, JAUŠOVEC, Ksenija. Resting brain activity : differences between genders. Neuropsychologia, ISSN 0028-3932. [Print ed.], 2010, vol. 48, iss. 13, str. 3918-3925, ilustr., doi: 10.1016/j.neuropsychologia.2010.09.020.

JAUŠOVEC, Norbert, JAUŠOVEC, Ksenija. Sex differences in mental rotation and cortical activation patterns : can training change them?. Intelligence, ISSN 0160-2896. [Print ed.], mar./apr. 2012, vol. 40, no. 2, str. 151-162, ilustr., doi: 10.1016/j.intell.2012.01.005.

Univerza v Mariboru

Filozofska fakulteta

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Napredne raziskovalne metode v psihologiji
Course title:	Advanced psychological research methods

Študijski program in stopnja **Study programme and level**	**Študijska smer** **Study field**	**Letnik** **Academic year**	**Semester** **Semester**
Vedenjska in kognitivna nevroznanost, 3. stopnja		**1.**	**1.**
Behavioral and Cognitive Neuroscience, 3rd Degree		**1.**	**1.**

Vrsta predmeta / Course type obvezni/obligatory

Univerzitetna koda predmeta / University course code:

Predavanja **Lectures**	**Seminar** **Seminar**	**Vaje** **Tutorial**	**Klinične vaje** **work**	**Druge oblike študija** **(Laboratorijske vaje)**	**Samost. delo** **Individ. work**	**ECTS**
30				**30**	**240**	**10**

Nosilec predmeta / Lecturer: Sara Tement

Jeziki / Languages:	
Predavanja / Lectures:	slovenski / slovene
Vaje / Tutorial:	slovenski / slovene

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisites:**
Pogoji za vključitev v delo: Pogojev ni. **Pogoji za opravljanje študijskih obveznosti**: Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno. Pozitivna ocena iz problemsko zastavljenih pisnih nalog je pogoj za pristop k ustnemu izpitu.	**Prerequisites for attending the course:** None. **Prerequisites for completing the course:** Each of the mentioned commitments must be assessed with a passing grade. Passing grade of the problem-based learning exercises is required for taking the oral examination.

Vsebina:	**Content (Syllabus outline):**

1. Raziskovalni načrti v psihologiji in potek psihološkega raziskovanja: Generiranje idej in raziskovalnega problema, formulacija hipotez, izbira metode zbiranje podatkov, etični vidiki raziskovanja) 2. Merjenje v psihologiji: Značilnosti kakovostnega merjenja, določanje zanesljivosti in veljavnosti 3. Analiza eksperimentalnih in kvazieksperimentalnih podatkov: Različne oblike analize razlik med skupinami 4. Analiza korelacijski podatkov: Multipla regresija, strukturno modeliranje, analiza moderacije in mediacije 5. Dodatne vsebine glede na tematiko naloge: Analiza vzdolžnih/longitudinalnih podatkov, analiza diad, konstrukcija novega psihološkega instrumenta in preverjanje merskih značilnosti	1. Psychological research designs and the research process: Generation of ideas and research problems, hypotheses development, the choice of a research approach, ethical considerations in research 2. Psychological measurement: Characteristics of quality measurement, reliability and validity testing 3. Analysis of experimental/quasi-experimental data: Different approaches for examining group differences 4. Analysis for correlational data: Multiple regression, structural equation modeling, moderation and mediation analyses 5. Special topics based on own research problem: Analysis of longitudinal data, dyadic data analysis, questionnaire construction and testing of psychometric properties

Temeljni literatura in viri / Readings:

Brown, T. A. (2015). *Confirmatory Factor Analysis for Applied Research* (2nd ed.). New York: The Guilford Press.
DeVellis, R. F. (2012). *Scale development: Theory and applications* (3rd ed.). Thousand Oaks, CA: Sage Publications.
Cohen, B. H. (2014). *Explaining Psychological Statistics* (4th ed.). New York: Wiley
Field, A. (2005). *Discovering statistics using SPSS.* London: Sage.
Leong, F. T. L. & Austin, J. T. (2006). *The psychology research handbook: A guide for graduate students and research assistants* (2nd ed.). Thousand Oaks, CA: Sage Publications.
Hayes, A. F. (2013). *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach.* New York: The Guilford Press.
Kline, R. B. (2015). *Principles and Practice of Structural Equation Modeling* (4th ed.). New York: The Guilford Press.

Cilji in kompetence:	**Objectives and competences:**

Cilj predmeta je študente seznaniti z osnovnimi metodami psihološkega raziskovanja in z vsemi fazami raziskovalnega procesa. Po izvedbi predmeta bodo študenti razumeli razlike med raziskovalnimi načrti, znali samostojno zastaviti raziskovalni načrt in ustrezno formulirati hipoteze. Študenti bodo tekom predmeta nadgradili obstoječe znanje o statističnih in psihometričnih analizah in bodo znali uporabiti ustrezne statistične analize za svoje raziskovalne načrte. Predmet študentom omogoča samostojno delo pri izvedbi raziskav od faze koncipiranja raziskava do obdelave podatkov, ob tem pa študenti razumejo posebnosti psihološkega raziskovanja in med raziskovalnim procesom dosledno upoštevajo etična načela.	The aim of the course is to introduce the students to the basic methods of psychological research and all stages of the research process. After successfully completing the course, students will understand the differences between the various research plans and will be able to independently develop a research plan and formulate appropriate hypotheses. During the course, students will upgrade their existing knowledge of the statistical and psychometric analyses and will be able to apply appropriate statistical analyses for their research plans. The course will enable students to work independently in carrying out their research projects from study conception to data analysis. During this process, students will gain understanding of the specific features of psychological research and will be able to adhere to ethical principles.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: Študenti razumejo posamezne faze raziskovalne procesa in statistične postopke. Svoje podatke znajo obdelati z ustreznimi statističnimi programi (SPSS, AMOS, Mplus). Študenti pridobljeno znanje znajo uporabiti pri samostojni izvedbi raziskovalnega projekta. Dodatno so študenti zmožni kritično ovrednotiti lastnih raziskovalni načrt ter njegove prednosti in pomanjkljivosti.	Knowledge and understanding: Student understand the different phases of the research process and various statistical procedures. They are able to analyze their data with appropriate statistical software (SPSS, AMOS, Mplus). Students are also able to implement the obtained knowledge when independently conducting a research project. Moreover, students are able to critically evaluate their own research agendas as well as their strengths and weaknesses.

Metode poučevanja in učenja:	**Learning and teaching methods:**
Interaktivna predavanja E-učenje Problemsko zastavljene naloge	Interactive frontal method E-learning Problem-based learning exercises

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**

Ustno izpraševanje	**50%**	Oral examination
Pisne naloge	**50%**	Coursework

Reference nosilca / Lecturer's references:

SEDLAR, Nataša, ŠPRAH, Lilijana, TEMENT, Sara, SOČAN, Gregor. Internal structure of an alternative measure of burnout : study on the Slovenian adaptation of the Oldenburg Burnout Inventory (OLBI). Burnout research, ISSN 2213-0586, Available online 20 February 2015, str. 1-7. http://www.sciencedirect.com/science/article/pii/S2213058615000029#, doi: 10.1016/j.burn.2015.02.001.

TEMENT, Sara, KORUNKA, Christian. The moderating impact of types of caregiving on job demands, resources, and their relation to work-to-family conflict and enrichment. Journal of family issues, ISSN 0192-513X, 2015, 36, no. 1, str. 31-55, doi: 10.1177/0192513X13483971.

KOŠIR, Katja, TEMENT, Sara, LICARDO, Marta, HABE, Katarina. Two sides of the same coin? : the role of rumination and reflection in elementary school teachers' classroom stress and burnout. Teaching and teacher education, ISSN 0742-051X. [Print ed.], 2015, vol. 47, str. 131-141, doi: 10.1016/j.tate.2015.01.006.

MUSIL, Bojan, TEMENT, Sara, BAKRAČEVIČ VUKMAN, Karin, ŠOŠTARIČ, Ajda. Aggression in school and family contexts among youngsters with special needs : qualitative and quantitative evidence from the TranSpace project. Children and youth services review, ISSN 0190-7409, September 2014, vol. 44, str. 46-55, ilustr., doi: 10.1016/j.childyouth.2014.06.005.

KOŠIR, Katja, TEMENT, Sara. Teacher-student relationship and academic achievement: a cross-lagged longitudinal study on three different age groups. European journal of psychology of education, ISSN 0256-2928, 2014, vol. 29, iss. 3, str. 409-428, tabele, doi: 10.1007/s10212-013-0205-2.

KUBICEK, Bettina, KORUNKA, Christian, TEMENT, Sara. Too much job control? : two studies on curvilinear relations between job control and eldercare workers' well-being. International journal of nursing studies, ISSN 0020-7489. [Print ed.], dec. 2014, 51, [no.] 12, str. 1644-1653, ilustr., doi: 10.1016/j.ijnurstu.2014.05.005.

TEMENT, Sara. The role of personal and key resources in the family-to-work enrichment process. Scandinavian journal of psychology, ISSN 0036-5564, Oct. 2014, vol. 55, iss. 5, str. 489-496, ilustr., doi: 10.1111/sjop.12146.

TEMENT, Sara, KORUNKA, Christian. Does trait affectivity predict work-to-family conflict and enrichment beyond job characteristics?. The Journal of psychology, ISSN 0022-3980, 2013, vol. 147, no. 2, str. 197-216, tabele, doi: http://dx.doi.org/10.1080/00223980.2012.683053.

RANTANEN, Johanna, KINNUNEN, Ulla, MAUNO, Saija, TEMENT, Sara. Patterns of conflict and enrichment in work-family balance : a three-dimensional typology. Work and stress, ISSN 0267-8373, 2013, vol. 27, no. 2, str. 141-163, doi: 10.1080/02678373.2013.791074.

Univerza v Mariboru

Filozofska fakulteta

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Nevrofiziologija
Course title:	Neurophysiology

Študijski program in stopnja **Study programme and level**	**Študijska smer** **Study field**	**Letnik** **Academic year**	**Semester** **Semester**
Vedenjska in kognitivna nevroznanost, 3. stopnja		**1.**	**2..**
Behavioral and Cognitive Neuroscience, 3rd Degree		**1.**	**2.**

Vrsta predmeta / Course type obvezni/obligatory

Univerzitetna koda predmeta / University course code:

Predavanja **Lectures**	**Seminar** **Seminar**	**Vaje** **Tutorial**	**Klinične vaje** **work**	**Druge oblike študija**	**Samost. delo** **Individ. work**	**ECTS**
30	**30**				**240**	**10**

Nosilec predmeta / Lecturer: Marjan Rupnik, Jurij Dolenšek, Andraž Stožer

Jeziki / Languages:	
Predavanja / Lectures:	slovenski / slovene
Seminar / Seminar:	slovenski / slovene

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

Pogoji za vključitev v delo: Pogojev ni.

Pogoji za opravljanje študijskih obveznosti:
Vsaka izmed definiranih obveznosti mora biti zaključena s pozitivno oceno. Ocena enaka ali višja minimalni (6/10) na testu iz predavanj in seminarjev, ki vsebuje problemske naloge, je predpogoj za pristop k ustnemu izpitu.

Prerequisites:

Prerequisites for attending the course: None.

Prerequisites for completing the course:
Each of the defined commitments must be completed with a passing grade. A grade equal to or higher than the passing minimum (6/10) of the problem-based test based on lectures and seminars is required for taking the oral examination.

Vsebina:

Content (Syllabus outline):

1. Uvod v nevrofiziologijo 2. Struktura in funkcija nevronov in nevroglije 3. Sinaptični prenos 4. Senzorični sistem 5. Motorični sistem 6. Višje živčne funkcije in plasticnost zivcevja 7. Osnove nevropatofiziologije	1. Introduction to neurophysiology 2. Structure and function of neurons and neuroglia 3. Synaptic transmission 4. Sensory system 5. Motor system 6. Higher functions of the nervous system and neural plasticity 7. Basics of neuropathophysiology

Temeljni literatura in viri / Readings:

Kandel ER, Schwartz JH, Jessel TM, Siegelbaum SA, Hudspeth AJ. Principles of Neural Science. Fifth Edition. McGraw-Hill, New York: 2013.
Boron WF, Boulpaep EL. Medical Physiology. 2e Updated Edition. Saunders, Philadelphia: 2012.
Rang HP, Ritter JM, Flower RJ, Henderson G. Rang & Dale´s Pharmacology, 8e 8th Edition. Elsevier Churchill Livingstone, Edinburgh: 2015.
Purves D. Neuroscience. 5th edition. Sinauers 2012.

Cilji in kompetence:	**Objectives and competences:**
Poglavitni cilj predmeta je pridobitev znanj o strukturi in funkciji nevronov in nevroglije, o celični organizaciji in vzdražnosti, zakonitostih sinaptičnega prenosa in organizaciji nevronov v jedra, traktuse in funkcionalne enote, ki so podlaga senzoričnega in motoričnega sistema, so podlaga za plastičnost živčevja ter omogočajo višje živčne funkcije (mišljenje in vedenje). Na osnovi znanja o normalni strukturi in funkciji bo študent dobil vpogled tudi v nevropatofiziologijo najpogostejših bolezni, kot so anksioznost, shizofrenija, depresija in demenca.	The major aim of the course is to gain knowledge on structure and function of neurons and neuroglia, on cellular organization and excitability, principles of synaptic transmission and organization of neurons into nuclei, tractus and functional units that form the basis of the sensory and motor system, its plasticity, and enable higher functions of the nervous system (cognition and behavior). On the basis of the knowledge about normal structure and function, the student will gain insight into neuropathophysiology of most common diseases, such as anxiety, schizophrenia, depression and dementia.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: Znanje o in razumevanje strukture citoplazme in membrane nevronov in nevroglije, o vzdražnosti nevronov in nevroglije, o anatomiji jeder in traktusov ter višjih centrov. Znanje in razumevanje načina komunikacije med celicami v centralnem živčnem sistemu, o njihovi plastičnosti, o živčnih prenašalcih in osnovah delovanja zdravil, ki delujejo v centralnem živčnem sistemu. Poznavanje osnov zaznavanja, motorike in višjih funkcij ter	Knowledge and understanding: Knowledge about and understanding of structure of cytoplasm and membrane of neurons and neuroglia, of neuoronal and glial excitability, of nuclei, tractus and higher centers. Knowledge and understanding of modes of communication between cells in the central nervous system, its olasticity, about neurotransmitters and modes of action of drugs acting in the central nervous system. Knowledge about and understanding of the principles of

nastanka bolezni.	sensation and motor actions, as well as the most common central nervous system disorders.

Metode poučevanja in učenja:	**Learning and teaching methods:**
Interaktivna predavanja E-učenje Problem-based seminars	Interactive frontal method E-learning Problem-based seminars

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Pisne naloge	**70 %**	Coursework
Ustni izpit	**30 %**	Oral examination

Reference nosilcev / Lecturers´ references:

GOSAK, Marko, STOŽER, Andraž, MARKOVIČ, Rene, DOLENŠEK, Jurij, MARHL, Marko, RUPNIK, Marjan, PERC, Matjaž. The relationship between node degree and dissipation rate in networks of diffusively coupled oscillators and its significance for pancreatic beta cells. *Chaos*, ISSN 1054-1500, July 2015, vol. 25, iss. 7, 073115-1-073115-8, doi: 10.1063/1.4926673.

GOSAK, Marko, DOLENŠEK, Jurij, MARKOVIČ, Rene, RUPNIK, Marjan, MARHL, Marko, STOŽER, Andraž. Multilayer network representation of membrane potential and cytosolic calcium concentration dynamics in beta cells. *Chaos, solitons and fractals*. [Print ed.], 2015, vol. 80, str. 76-82, ilustr. http://www.sciencedirect.com/science/article/pii/S0960077915001794, doi: 10.1016/j.chaos.2015.06.009.

MARQUARD, Jan, SKELIN, Maša, STOŽER, Andraž, RUPNIK, Marjan, et al. Characterization of pancreatic NMDA receptors as possible drug targets for diabetes treatment. *Nature medicine*, ISSN 1078-8956, Apr. 2015, vol. 21, no. 4, str. 363-372, ilustr.http://www.nature.com/nm/journal/vaop/ncurrent/pdf/nm.3822.pdf, doi: 10.1038/nm.3822.

STOŽER, Andraž, GOSAK, Marko, DOLENŠEK, Jurij, PERC, Matjaž, MARHL, Marko, RUPNIK, Marjan, KOROŠAK, Dean. Functional connectivity in islets of Langerhans from mouse pancreas tissue slices. *PLoS computational biology*, ISSN 1553-734X. [Print ed.], Feb. 2013, vol. 9, iss. 2, str. e100292312-1-e1002923-12, doi: 10.1371/journal.pcbi.1002923.

BREGANT, Janez, STOŽER, Andraž, CERKVENIK, Marko. Molecular reduction : reality or fiction?. *Synthese*, ISSN 0039-7857, 2010, 172, str. 437-450, doi: 10.1007/s11229-008-9401-z.

MARCINIAK, Anja, COHRS, Christian M, TSATA, Vasiliki, CHOUINARD, Julie A, SELCK, Claudia, STERTMANN, Julia, REICHELT, Saskia, ROSE, Tobias, EHEHALT, Florian, WEITZ, Jürgen, SOLIMENA, Michele, RUPNIK, Marjan, SPEIER, Stephan. Using pancreas tissue slices for in situ studies of islet of Langerhans and acinar cell biology. *Nature protocols*, ISSN 1754-2189, 2014, vol. 9, no. 12, str. 2809-2822. http://www.nature.com/nprot/journal/v9/n12/full/nprot.2014.195.html,

doi: 10.1038/nprot.2014.195.

LIPOVŠEK DELAKORDA, Saška, JANŽEKOVIČ, Franc, LEITINGER, Gerd, RUPNIK, Marjan. Rab3a ablation related changes in morphology of secretory vesicles in major endocrine pancreatic cells, pituitary melanotroph cells and adrenal gland chromaffin cells in mice. *General and comparative endocrinology*, ISSN 0016-6480, 2013, vol. 185, str. 67-79. http://dx.doi.org/10.1016/j.ygcen.2013.01.007.

SEDEJ, Simon, SKELIN, Maša, SCHLÜTER, Oliver M., RUPNIK, Marjan. Rab3a is critical for trapping alpha-MSH granules in the high Ca2+-affinity pool by preventing constitutive exocytosis. *PloS one*, ISSN 1932-6203, 2013, vol. 8, iss. 10, str. 1-12, ilustr.http://www.plosone.org/article/fetchObject.action?uri=info%3Adoi%2F10.1371%2Fjournal.pone.0078883&representation=PDF, doi: 10.1371/journal.pone.0078883.

DOLENŠEK, Jurij, STOŽER, Andraž, SKELIN, Maša, MILLER, Evan, RUPNIK, Marjan. The relationship between membrane potential and calcium dynamics in glucose-stimulated beta cell syncytium in acute mouse pancreas tissue slices. *PloS one*, ISSN 1932-6203, 2013, vol. 8, iss. 12, str. 1-16, ilustr. http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0082374, doi: 10.1371/journal.pone.0082374.

DOLENŠEK, Jurij, ŠPELIČ, Denis, SKELIN, Maša, ŽALIK, Borut, GOSAK, Marko, RUPNIK, Marjan, STOŽER, Andraž. Membrane potential and calcium dynamics in beta cells from mouse pancreas tissue slices : theory, experimentation, and analysis. *Sensors*, ISSN 1424-8220, 2015, vol. 15, iss. 11, str. 27393-27419, ilustr. http://www.mdpi.com/1424-8220/15/11/27393, doi: 10.3390/s151127393.

Univerza v Mariboru

Filozofska fakulteta

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Napredne raziskovalne metode v fiziologiji
Course title:	Advanced research methods in physiology

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Vedenjska in kognitivna nevroznanost, 3. stopnja		**1.**	**2.**
Behavioral and Cognitive Neuroscience, 3rd Degree		**1.**	**2.**

Vrsta predmeta / Course type obvezni/obligatory

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija (Laboratorijske vaje)	Samost. delo Individ. work	ECTS
30				**30**	**240**	**10**

Nosilec predmeta / Lecturer: Andraž Stožer, Jurij Dolenšek, Marko Gosak

Jeziki / Languages:	
Predavanja / Lectures:	slovenski / slovene
Seminar / Seminar:	slovenski / slovene

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

Pogoji za vključitev v delo: Pogojev ni.

Pogoji za opravljanje študijskih obveznosti:
Vsaka izmed definiranih obveznosti mora biti zaključena s pozitivno oceno. Ocena enaka ali višja minimalni (6/10) na testu iz predavanj, seminarjev in vaj, ki vsebuje problemske naloge, je predpogoj za pristop k ustnemu izpitu.

Prerequisites:

Prerequisites for attending the course: None.

Prerequisites for completing the course:
Each of the defined commitments must be completed with a passing grade. A grade equal to or higher than the passing minimum (6/10) of the problem-based test based on lectures, seminars, and practicals is required for taking the oral examination.

Vsebina:

Content (Syllabus outline):

1. Uvod v napredne metode v fiziologiji: od posameznih celic do organizma kot celote 2. Metoda vpete krpice membrane (patch-clamp) za določevanje aktivnosti ionskih kanalov 3. Konfokalno slikanje spremembe znotrajcelične koncentracije kalcijevih ionov za določevanje celične aktivnosti 4. Merjenje eksocitoze 5. Elektrofiziološke osnove delovanja srca, EKG in HRV 6. Elektrofiziološke osnove EEG 7. Elektrofiziološke osnove EMG 8. Integrativna fiziologija: dihanje, delovanje ledvic in srca 9. Napredne metode obdelave podatkov: procesiranje podatkov in napredne analitične metode (analiza časovnih vrst, teorija kompleksnih mrež)	1. Introduction to advanced methods in physiology: from individual cells to the organism as a whole 2. The patch-clamp method to measure activity of ion channels 3. Confocal imaging of intracellular calcium concetration changes 4. Measuring exocytosis to measure cellular activity 5. Electrophysiological basis of heart action, ECG, and HRV 6. Electrophysiological basis of EEG 7. Electrophysiological basis of EMG 8. Intergative physiology: respiration, kidney and heart function 9. Advanced methods of data analysis: processing and advanced analysis (time series analysis, complex network theory)

Temeljni literatura in viri / Readings:

Kandel ER, Schwartz JH, Jessel TM, Siegelbaum SA, Hudspeth AJ. Principles of Neural Science. Fifth Edition. McGraw-Hill, New York: 2013.
Boron WF, Boulpaep EL. Medical Physiology. 2e Updated Edition. Saunders, Philadelphia: 2012.
Stožer A, Križančić-Bombek L, Dolenšek J, Skelin M. Izbrana poglavja iz fiziologije z navodili za vaje. Univerza v Mariboru, Medicinska fakulteta, Maribor: 2012.
Hobbie RK, Roth BJ. Intermediate Physics for Medicine and Biology. Fourth Edition. Springer, Heidelberg: 2007.
Molleham A. Patch Clamping An Introductory Guide to Patch Clamp Electrophysiology. Wiley & Sons 2003.
Pawley J. Handbook of Biological Confocal Microscopy. Third edition. Springer, 2006.

Cilji in kompetence:	**Objectives and competences:**
Poglavitni cilj predmeta je pridobitev teoretičnih znanj in praktičnih veščin za izvedbo meritev fiziološke aktivnosti človeka na širokem organizacijskem razponu: na nivoju celice, organskih sistemov in organizma kot celote. Teoretične osnove in praktično obdelovanje v meritvah pridobljenih surovih podatkov.	The major aim of the course is to gain theoretical knowledge and practical skills to conduct measurements of physiological activity of a human on a different organizational levels: at the level of a single cell, organ systems, and the organism as a whole. Theoretical basis and practical processing of experimentally acquired raw data.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: Znanje o in razumevanje fizioloških meritev kot mero aktivnosti ljudi na nivoju posameznih celic (metoda vpete krpice membrane in konfokalno slikanje), na nivoju organov (konfokalno slikanje, EKG, HRV, EEG, EMG) in na nivoju organizma kot celote (povezovanje pridobljenih podatkov o delovanju posameznih organov v celoto). Znanje in uporaba metod za obdelovanje fizioloških podatkov	Knowledge and understanding: Knowledge about and understanding of physiological measurements enabling determination of human activity on the organizational level of single cells (patch clamp technique, confocal imaging), on the level of organs (confocal imaging, ECG, HRV, EEG, EMG), and on the level of body as a whole (integrating acquired data of human body organ activities). Knowledge and application of methods of physiological data processing.

Metode poučevanja in učenja:	**Learning and teaching methods:**
Interaktivna predavanja E-učenje Problem-based seminars Praktične vaje	Interactive frontal method E-learning Problem-based seminars Practicals

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Pisne naloge Ustni izpit	**70 %** **30 %**	Coursework Oral examination

Reference nosilcev / Lecturers´ references:

GOSAK, Marko, STOŽER, Andraž, MARKOVIČ, Rene, DOLENŠEK, Jurij, MARHL, Marko, RUPNIK, Marjan, PERC, Matjaž. The relationship between node degree and dissipation rate in networks of diffusively coupled oscillators and its significance for pancreatic beta cells. *Chaos*, ISSN 1054-1500, July 2015, vol. 25, iss. 7, 073115-1-073115-8, doi: 10.1063/1.4926673.

GOSAK, Marko, DOLENŠEK, Jurij, MARKOVIČ, Rene, RUPNIK, Marjan, MARHL, Marko, STOŽER, Andraž. Multilayer network representation of membrane potential and cytosolic calcium concentration dynamics in beta cells. *Chaos, solitons and fractals*. [Print ed.], 2015, vol. 80, str. 76-82, ilustr. http://www.sciencedirect.com/science/article/pii/S0960077915001794, doi: 10.1016/j.chaos.2015.06.009.

MARQUARD, Jan, SKELIN, Maša, STOŽER, Andraž, RUPNIK, Marjan, et al. Characterization of pancreatic

NMDA receptors as possible drug targets for diabetes treatment. *Nature medicine*, ISSN 1078-8956, Apr. 2015, vol. 21, no. 4, str. 363-372, ilustr.http://www.nature.com/nm/journal/vaop/ncurrent/pdf/nm.3822.pdf, doi: 10.1038/nm.3822.

STOŽER, Andraž, GOSAK, Marko, DOLENŠEK, Jurij, PERC, Matjaž, MARHL, Marko, RUPNIK, Marjan, KOROŠAK, Dean. Functional connectivity in islets of Langerhans from mouse pancreas tissue slices. *PLoS computational biology*, ISSN 1553-734X. [Print ed.], Feb. 2013, vol. 9, iss. 2, str. e100292312-1-e1002923-12, doi: 10.1371/journal.pcbi.1002923.

BREGANT, Janez, STOŽER, Andraž, CERKVENIK, Marko. Molecular reduction : reality or fiction?. *Synthese*, ISSN 0039-7857, 2010, 172, str. 437-450, doi: 10.1007/s11229-008-9401-z.

ŠIMONKA, Vito, FRAS, Maja, GOSAK, Marko. Stochastic simulation of the circadian rhythmicity in the SCN neuronal network. *Physica. A, Statistical mechanics and its applications*, ISSN 0378-4371. [Print ed.], 2015, vol. 424, str. 1-10, ilustr., doi: 10.1016/j.physa.2014.12.034.

DOLENŠEK, Jurij, STOŽER, Andraž, SKELIN, Maša, MILLER, Evan, RUPNIK, Marjan. The relationship between membrane potential and calcium dynamics in glucose-stimulated beta cell syncytium in acute mouse pancreas tissue slices. *PloS one*, ISSN 1932-6203, 2013, vol. 8, iss. 12, str. 1-16, ilustr. http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0082374, doi: 10.1371/journal.pone.0082374.

DOLENŠEK, Jurij, ŠPELIČ, Denis, SKELIN, Maša, ŽALIK, Borut, GOSAK, Marko, RUPNIK, Marjan, STOŽER, Andraž. Membrane potential and calcium dynamics in beta cells from mouse pancreas tissue slices : theory, experimentation, and analysis. *Sensors*, ISSN 1424-8220, 2015, vol. 15, iss. 11, str. 27393-27419, ilustr. http://www.mdpi.com/1424-8220/15/11/27393, doi: 10.3390/s151127393.

GOSAK, Marko, GUIBERT, Christelle, BILLAUD, Marie, ROUX, Etienne, MARHL, Marko. The influence of gap junction network complexity on pulmonary artery smooth muscle reactivity in normoxic and chronically hypoxic conditions. *Experimental physiology*, ISSN 0958-0670, 2014, vol. 99, no. 1, str. 272-285, doi: 10.1113/expphysiol.2013.074971.

FRAS, Maja, GOSAK, Marko. Spatiotemporal patterns provoked by environmental variability in a predator-prey model. *Biosystems*, ISSN 0303-2647. [Print ed.], 2013, vol. 114, iss. 3, str. 172-177, doi: 10.1016/j.biosystems.2013.09.004.

GOSAK, Marko, MARKOVIČ, Rene, MARHL, Marko. The role of neural architecture and the speed of signal propagation in the process of synchronization of bursting neurons. *Physica. A, Statistical mechanics and its applications*, ISSN 0378-4371. [Print ed.], 2012, vol. 391, no. 8, str. 2764-2770, ilustr., doi: 10.1016/j.physa.2011.12.027.

BODENSTEIN, Christian, GOSAK, Marko, SCHUSTER, Stefan, MARHL, Marko, PERC, Matjaž. Modeling the seasonal adaptation of circadian clocks by changes in the network structure of the suprachiasmatic nucleus. *PLoS computational biology*, ISSN 1553-734X. [Print ed.], Sep. 2012, vol. 8, iss. 9, e1002697-1-e1002697-12, doi: 10.1371/journal.pcbi.1002697.

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UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Individualno raziskovalno delo I (IRD-I)
Course title:	Individual research work I

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Vedenjska in kognitivna nevroznanost, 3. stopnja		**1.**	**2.**
Behavioral and Cognitive Neuroscience, 3rd Degree		**1.**	**2.**

Vrsta predmeta / Course type obvezni/obligatory

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija (Individualno delo)	Samost. delo Individ. work	ECTS
				60	**240**	**10**

Nosilec predmeta / Lecturer: mentor

Jeziki / Languages:	
Predavanja / Lectures:	slovenski/ slovene
Vaje / Tutorial:	slovenski / slovene

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

Pogoji za vključitev v delo: Pogojev ni.

Pogoji za opravljanje študijskih obveznosti: Pogojev ni.

Prerequisites:

Prerequisites for attending the course: None.

Prerequisites for completing the course: Pogojev ni.

Vsebina:

Priprava prijave doktorske disertacije:
študent v sodelovanju z mentorjem opredeli temo svoje doktorske disertacije.

Content (Syllabus outline):

The submission of the proposed doctoral thesis: in collaboration with mentor student determines his/her PhD dissertation theme.

Temeljni literatura in viri / Readings:

Po dogovoru z mentorjem

Cilji in kompetence:

Objectives and competences:

Študent pripravi dispozicijo, v kateri opredeli temo in namen svoje disertacije, določi raziskovalne metode in navede predvidene vire.	Student prepares disposition in which he/ she defines theme and purpose of his/ her dissertation, determines research methods and planned sources.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: Razume ključne značilnosti raziskovanja. Po opravljenem predmetu IRD I študent zna oblikovati raziskovalna vprašanja in pozna metode, s pomočjo katerih lahko razišče svoje hipoteze. Prenesljive/ključne spretnosti in drugi atributi: Sposobnost ustnega in pisnega sporočanja dobljenih raziskovalnih ugotovitev	Knowledge and Understanding: The understanding of key concepts in experimental research. After completion of this course the student knows how to form research questions and knows methods by which he/ she can research his/ her hypotheses. Transferable/Key Skills and other attributes: The ability to transfer orally and in written form the experimentally obtained research findings.

Metode poučevanja in učenja:	**Learning and teaching methods:**
Individualne konzultacije in samostojno delo študenta.	Individual consultations and independent student's work.

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Študent prijavi temo doktorske disertacije (pribl. 5000 znakov)	**100%**	Student prepares the theme of the doctoral dissertation (approx. 5000 signs)

Reference nosilca / Lecturer's references:

gl. reference vseh nosilcev na študijskem programu *Vedenjska in kognitivna nevroznanost.*

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UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Biotehnika in nevroznanost
Course title:	Bioengineering and neuroscience

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Vedenjska in kognitivna nevroznanost, 3. stopnja		**2.**	**1.**
Behavioral and Cognitive Neuroscience, 3rd Degree		**2.**	**1.**

Vrsta predmeta / Course type obvezni/obligatory

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija (Laboratorijske vaje)	Samost. delo Individ. work	ECTS
30				**30**	**240**	**10**

Nosilec predmeta / Lecturer: Aleš Holobar

Jeziki / Languages:	
Predavanja / Lectures:	slovenski/ slovene
Vaje / Tutorial:	slovenski / slovene

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

Pogoji za vključitev v delo: Poznavanje osnov biotehnike, fiziologije in raziskovalnega dela z računalniki in računalniško upravljanimi medicinskimi napravami.

Pogoji za opravljanje študijskih obveznosti: Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno.

Prerequisites:

Prerequisites for attending the course: Basic knowledge about bioengineering, physiology, and research work using computers and computer-based medical devices.

Prerequisites for completing the course: Each of the mentioned commitments must be assessed with a passing grade.

Vsebina:

Content (Syllabus outline):

- Uvod v fiziologijo in biofiziko izbranih fizioloških sistemov (čuti, skeletno mišični sistem, živčni sistem): celična biofizika, , modeliranje in obnašanje nevronov, občutki, sinaptična dovzetnost, obnašanje nevronskih mrež v možganski skorji, Elektrofiziologija:, zunaj- in znotrajcelično snemanje
- Klinično in eksperimentalno zajemanje ter analiza bioelektričnih signalov in slik:
    - večkanalna elektroencefalografija (EEG): izvori električneaktivnosti, razpoznavanje oblik in karakterizacija EEG (normalna in nenormalna aktivnost možganov, biološke motnje in šum), analiza neodvisnih komponent pri EEG;
    - magnetna encefalografija (MEG): lociranje izvorov in inverzni problem, , analiza neodvisnih komponent pri MEG, uporaba MEG v kognitivni nevroznanosti;
    - slikanje s funkcionalno magnetno resonanco (fMRI) in difuzijsko tenzorsko slikanje (DTI): principi in pristopi k podatkovni analizi pri fMRI, fMRI in EEG, praktični primeri v zvezi z nevroznanostjo;
    - pozitronska emisijska tomografija (PET) in računalniška tomografija z emisijo posameznih fotonov (SPECT): princip delovanja, , uporaba v nevroznanosti;
    - spektroskopsko slikanje pri valovnih dolžinah blizu infrardeče svetlobe (NIRS):

- Basic physiology and biophysics of selected physiological systems (senses, skeletal-muscular system, nervous system): cell biophysics;; neuron modelling and behavior;; synaptic plasticity; behaviour of neural networks in cortical column;
- Electrophysiology:; intracellular and extracellular recording;
- Clinical and experimental bioelectrical signal and image acquisition and analysis:
    - Multichannel electroencephalography (EEG): sources of EEG activity; pattern recognition and characterization of EEG signals (normal and abnormal activity, biological and external artefacts);Independent Component Analysis of EEG.
    - Magnetoencephalography (MEG): source localization and the inverse problem;; Independent Component Analysis of MEG; applications of MEG in cognitive neuroscience;
    - Functional magnetic resonance imaging (fMRI) and diffusion tensor imaging (DTI): main principles and approaches to data analysis; fMRI and EEG; practical examples: case studies in neuroscience;
    - Positron emission tomography (PET and single photon emission computed tomography (SPECT): main principles and image reconstruction techniques ; applications in neuroscience;
    - Near-infrared spectroscopic imaging (NIRSI): basic principles and instrumentation;

osnovna načela in instrumenti, uporaba v nevroznanosti; ○ elektronevrografija (ENG) in elektromiografija (EMG): nastanek živčnih in mišičnih akcijskih potencialov, dovajanje in odvajanje informacij (možgani, hrbtenjača, mišice, čutila), možganske strategije nadzora mišic, merjenje in analiza živčnih in mišičnih signalov, povezave z nevroznanostjo. • Magnetna stimulacija možganov (TMS) ○ principi delovanja, oprema in tehnike za TMS; ○ praktični primeri: stimulacije s TMS v nevroznanosti. • Vmesniki možgani-stroj in mišice-stroj glavne značilnosti in načini zajemanja podatkov; ○ možnosti in omejitve, etični pomisleki; ○ pregled obstoječih vmesnikov. • Izbrana poglavja iz obdelave biomedicinskih signalov in teorije ocenitev (vzorčenje, Nyquistov teorem, Fourierova analiza, kratkočasovna Fourierova analiza, filtriranje signalov).	applications in neuroscience; ○ Electroneurography (ENG) and electromyography (EMG): generation of neural and muscle action potential; afferent and efferent transmission of information (brain, spinal cord, muscles, sensors); central control strategies of muscles; perception; measurement and analysis of EMG and ENG; links to neuroscience. • Transcranial magnetic stimulation (TMS): ○ Background and principles, TMS equipment and techniques; ○ practical applications of TMS stimulation in neuroscience. • Brain and muscle-computer interfaces (BCI): ○ main principles and data acquisition modalities; ○ possibilities and limitations, ethical considerations; ○ overview of existing interfaces. • Selected topics in biomedical signal processing and estimation theory (sampling, Nyquist theorem, Fourier analysis, short-time Fourier analysis and filters).

Temeljni literatura in viri / Readings:

- P. Bright: Neuroimaging – Methods (2012), InTech.
- J. P. Hornak: The Basics of MRI (2014), Rochester Institute of Technology.
- M. Akay: Handbook of Neural Engineering (2007), IEEE Press
- S. Cerutti, C. Marchesi: Advanced Methods of Biomedical Signal Processing (2011), IEEE Press.
- E. Niedermeyer, F. L. da Silva: Electroencephalography : basic principles, clinical applications, and related fields (2005), Lippincott Williams & Wilkins.
- J. Wolpaw, E. W. Wolpaw: Brain-Computer Interfaces: Principles and Practice (2012), Oxford University Press.

Cilji in kompetence:	**Objectives and competences:**
Cilj predmeta je posredovati celovit pregled fizioloških ozadij, tehnik in metod zajemanja, modelov in analiz v zvezi z biomedicinskimi signali in slikami centralnega in perifernega živčnega sistema. Znanstveno bodo utemeljene povezave s kognitivno nevroznanostjo in njenimi uporabnimi vidiki.	This course gives students a thorough overview of physiological backgrounds, acquisition techniques and methods, models and analysis related to biomedical signals and functional neuroimaging. Their links with, and practical implications in, cognitive neuroscience will be scientifically substantiated.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: Po zaključku tega predmeta bo študent sposoben • razumeti povezave med fiziološkimi in fizikalnimi ozadji ter modernimi tehnikami za spremljanje biomedicinskih signalov in slik, • analizirati potrebe po takšnih pristopih v zvezi s kognitivno nevroznanostjo, razvijati raziskovalne pristope v nevroznanosti, ki bodo vključevali obdelavo signalov in slik, • raziskati, razumeti in ovrednotiti obstoječe pristope, sklepati o možnih rešitvah in uvajati nove ideje za računalniško podporo kognitivni nevroznanosti.	Knowledge and understanding: On completion of this course the student will be able to • understand relationships between physiological and physical backgrounds and modern support techniques for biomedical signals and neuroimaging, • analyse necessities for such solutions in cognitive neuroscience, • develop research approaches with inclusion of signal and image processing, comprehend, research, and evaluate known approaches, infer on possible solutions and introduce new ideas for computer support to cognitive neuroscience.

Metode poučevanja in učenja:	**Learning and teaching methods:**
• predavanja, • seminarske vaje.	• lectures, • seminar work.

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Način (pisni izpit, ustno izpraševanje, naloge, projekt) • seminarska naloga, • ustni izpit.	 50% 50%	Type (examination, oral, coursework, project): • seminar work, • oral examination.

Reference nosilca / Lecturer's references:

FARINA, Dario, HOLOBAR, Aleš. Human-machine interfacing by decoding surface electromyogram. *IEEE signal processing magazine*, ISSN 1053-5888. [Print ed.], jan. 2015, vol. 32, no. 1, str. 115-120, [COBISS.SI-ID 18364950].

HOLOBAR, Aleš, MINETTO, Marco A., FARINA, Dario. Accurate identification of motor unit discharge patterns from high-density surface EMG and validation with a novel signal-based performance metric. Journal of neural engineering, ISSN 1741-2560, feb. 2014, vol. 11, no. 1, str. 1-11, [COBISS.SI-ID 17445654].

HOLOBAR, Aleš, GLASER, Vojko, GALLEGO, J.A., DIDERIKSEN, J.L., FARINA, Dario. Non-invasive characterization of motor unit behaviour in pathological tremor. Journal of neural engineering, ISSN 1741-2560, 2012, vol. 9, no. 5, str. 1-6, doi: 10.1088/1741-2560/9/5/056011. [COBISS.SI-ID 16676630].

HOLOBAR, Aleš, FARINA, Dario. Blind source identification from the multichannel surface electromyogram. Physiological measurement, ISSN 0967-3334. [Print ed.], 2014, vol. 35, no. 7, str. 143-165, ilustr. [COBISS.SI-ID 18016278].

FARINA, Dario, JIANG, Ning, REHBAUM, Hubertus, HOLOBAR, Aleš, GRAIMANN, Bernhard, DIETL, Hans, ASZMANN, Oskar. The extraction of neural information from the surface EMG for the control of upper-limb prostheses : emerging avenues and challenges. *IEEE transactions on neural systems and rehabilitation engineering*, ISSN 1534-4320. [Print ed.], jul. 2014, vol. 22, no. 4, str. 797-809,[COBISS.SI-ID 18018070].

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UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Individualno raziskovalno delo II (IRD-II)
Course title:	Individual research work II

Študijski program in stopnja **Study programme and level**	**Študijska smer** **Study field**	**Letnik** **Academic year**	**Semester** **Semester**
Vedenjska in kognitivna nevroznanost, 3. stopnja		**2.**	**4.**
Behavioral and Cognitive Neuroscience, 3rd Degree		**2.**	**4.**

Vrsta predmeta / Course type obvezni/obligatory

Univerzitetna koda predmeta / University course code:

Predavanja **Lectures**	**Seminar** **Seminar**	**Vaje** **Tutorial**	**Klinične vaje** **work**	**Druge oblike študija (Individualno delo)**	**Samost. delo** **Individ. work**	**ECTS**
				60	**540**	**20**

Nosilec predmeta / Lecturer: mentor

Jeziki / Languages: **Predavanja / Lectures:** slovenski/ slovene; **Vaje / Tutorial:** slovenski / slovene

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

Pogoji za vključitev v delo: Pogojev ni.

Pogoji za opravljanje študijskih obveznosti: Pogojev ni.

Prerequisites:

Prerequisites for attending the course: None.

Prerequisites for completing the course: Pogojev ni.

Vsebina:

Prijave doktorske disertacije:
Raziskovalno delo za izdelavo doktorske disertacije:
študent preveri stanje raziskav na področju, ki ga bo raziskoval, pripravi svoje raziskovalne hipoteze; razišče znanstveno literature s področja in opredeli znanstveno metodologijo.

Content (Syllabus outline):

The submission of the proposed doctoral thesis:
Research work directed toward the preparation of the doctoral thesis:
he/ she checks the research in the field of interest, prepares his/her research thesis, determines research methodology.

Temeljni literatura in viri / Readings:

Po dogovoru z mentorjem

Cilji in kompetence:	**Objectives and competences:**
Študent določi raziskovalne metode, s katerimi bo proučil hipoteze, ki jih je navedel v dispoziciji doktorske disertacije in navede predvidene vire.	Student defines and determines what research methods will be used in testing the hypotheses which were proposed in his doctoral disposition.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: Razume ključne značilnosti raziskovanja. Po opravljenem predmetu IRD II študent zna oblikovati raziskovalna vprašanja in pozna metode, s pomočjo katerih lahko razišče svoje hipoteze. Prenesljive/ključne spretnosti in drugi atributi: Sposobnost ustnega in pisnega sporočanja dobljenih raziskovalnih ugotovitev	Knowledge and Understanding: The understanding of key concepts in experimental research. After completion of this course the student knows how to form research questions and knows methods by which he/ she can research his/ her hypotheses. Transferable/Key Skills and other attributes: The ability to transfer orally and in written form the experimentally obtained research findings.

Metode poučevanja in učenja:	**Learning and teaching methods:**
Individualne konzultacije in samostojno delo študenta.	Individual consultations and independent student's work.

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Raziskovalni načrt (pribl. 5000 znakov)	**100%**	Research design (approx. 5000 signs)

Reference nosilca / Lecturer's references:

gl. reference vseh nosilcev na študijskem programu *Vedenjska in kognitivna nevroznanost.*

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UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Individualno raziskovalno delo III (IRD-III)
Course title:	Individual research work III

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Vedenjska in kognitivna nevroznanost, 3. stopnja		**3.**	**5.**
Behavioral and Cognitive Neuroscience, 3rd Degree		**3.**	**5.**

Vrsta predmeta / Course type obvezni/obligatory

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija (Individualno delo)	Samost. delo Individ. work	ECTS
				90	**810**	**30**

Nosilec predmeta / Lecturer: mentor

Jeziki / Languages:
Predavanja / Lectures: slovenski/ slovene
Vaje / Tutorial: slovenski / slovene

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

Pogoji za vključitev v delo: Pogojev ni.

Pogoji za opravljanje študijskih obveznosti: Pogojev ni.

Prerequisites:

Prerequisites for attending the course: None.

Prerequisites for completing the course: Pogojev ni.

Vsebina:

Raziskovalno delo za izdelavo doktorske disertacije:
Izvedba eksperimentov ali korelacijskih študij za potrditev zastavljene raziskovalne hipoteze
Priprava članka za objavo v znanstveni reviji

Content (Syllabus outline):

Research work directed toward the preparation of the doctoral thesis:
The conduction of experiments or correlational studies necessary for hypothesis verification
Preparation of an article targeting a high ranking journal in the field of research

Temeljni literatura in viri / Readings:

Po dogovoru z mentorjem

Cilji in kompetence:	**Objectives and competences:**
Študent izvede raziskavo/raziskave, s katerimi potrdi ali zavrže zastavljene hipoteze.	The student carries out a studies/studies in order to verify the proposed hypothesis.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: Razume ključne značilnosti raziskovanja. Po opravljenem predmetu IRD III študent zna izpeljati raziskavo, s pomočjo katere lahko razišče svoje hipoteze. Prenesljive/ključne spretnosti in drugi atributi: Sposobnost ustnega in pisnega sporočanja dobljenih raziskovalnih ugotovitev	Knowledge and Understanding: The understanding of key concepts in experimental research. After completion of this course the student knows how to conduct research to verify the proposed hypothesis. Transferable/Key Skills and other attributes: The ability to transfer orally and in written form the experimentally obtained research findings.

Metode poučevanja in učenja:	**Learning and teaching methods:**
Individualne konzultacije in samostojno delo študenta.	Individual consultations and independent student's work.

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Študent napiše članek za revijo zajeto v JCR (pribl. 10000 znakov)	**100%**	The student prepares a manuscript for publication in a journal cited in JCR (approx. 10000 signs)

Reference nosilca / Lecturer's references:

gl. reference vseh nosilcev na študijskem programu *Vedenjska in kognitivna nevroznanost.*

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UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Doktorska disertacija
Course title:	Doctoral Thesis

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Vedenjska in kognitivna nevroznanost, 3. stopnja		**3.**	**6.**
Behavioral and Cognitive Neuroscience, 3rd Degree		**3.**	**6.**

Vrsta predmeta / Course type	obvezni/obligatory
Univerzitetna koda predmeta / University course code:	

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija (Individualno delo)	Samost. delo Individ. work	ECTS
				90	**810**	**30**

Nosilec predmeta / Lecturer:	mentor
Jeziki / Languages: Predavanja / Lectures:	slovenski/ slovene
Vaje / Tutorial:	slovenski / slovene

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisites:**
Pogoji za vključitev v delo: Pogojev ni. **Pogoji za opravljanje študijskih obveznosti**: Pogojev ni.	**Prerequisites for attending the course:** None. **Prerequisites for completing the course:** Pogojev ni.

Vsebina:	**Content (Syllabus outline):**
Izdelava doktorske disertacije: V sodelovanju z mentorjem priprava in izdelava doktorske disertacije in priprava članka za objavo.	Preparation of the doctoral thesis: Preparation of the thesis and the manuscript in close collaboration with the supervisor.

Temeljni literatura in viri / Readings:

Po dogovoru z mentorjem

Cilji in kompetence: **Objectives and competences:**

Študent izdela doktorsko disertacijo in jo odda v oceno.	The student prepares the doctoral thesis.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: Razume ključne značilnosti raziskovanja in zna rezultate raziskave/raziskav ustrezno ovrednotiti in interpretirati in oblikovati ustrezen pisni izdelek. Prenesljive/ključne spretnosti in drugi atributi: Sposobnost ustnega in pisnega sporočanja dobljenih raziskovalnih ugotovitev	Knowledge and Understanding: The student understands key concepts in research. and knows how to evaluate and discuss research findings. Transferable/Key Skills and other attributes: The ability to transfer orally and in written form the experimentally obtained research findings.

Metode poučevanja in učenja:	**Learning and teaching methods:**
Individualne konzultacije in samostojno delo študenta.	Individual consultations and independent student's work.

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Doktorska disertacija	**100%**	Doctoral thesis

Reference nosilca / Lecturer's references:

gl. reference vseh nosilcev na študijskem programu *Vedenjska in kognitivna nevroznanost.*

IZBIRNE VSEBINE

Univerza v Mariboru

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UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Kognitivni razvoj
Course title:	Cognitive development

Študijski program in stopnja **Study programme and level**	**Študijska smer** **Study field**	**Letnik** **Academic year**	**Semester** **Semester**
Vedenjska in kognitivna nevroznanost, 3. stopnja		**1. ali 2.**	**1., 3. ali 4.**
Behavioral and Cognitive Neuroscience, 3rd Degree		**1. or 2.**	**1., 3. or 4.**

Vrsta predmeta / Course type izbirni/elective

Univerzitetna koda predmeta / University course code:

Predavanja **Lectures**	**Seminar** **Seminar**	**Vaje** **Tutorial**	**Klinične vaje** **work**	**Druge oblike študija**	**Samost. delo** **Individ. work**	**ECTS**
30	30				**240**	10

Nosilec predmeta / Lecturer: Karin Bakračevič Vukman

Jeziki / Languages:	
Predavanja / Lectures:	slovenski / slovene
Vaje / Tutorial:	slovenski / slovene

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

Pogoji za vključitev v delo: Pogojev ni.

Pogoji za opravljanje študijskih obveznosti: Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno. Pozitivna ocena iz problemsko zastavljenih pisnih nalog je pogoj za pristop k ustnemu izpitu.

Prerequisites:

Prerequisites for attending the course: None.

Prerequisites for completing the course: Each of the mentioned commitments must be assessed with a passing grade. Passing grade of the problem-based learning exercises is required for taking the oral examination.

Vsebina:

Content (Syllabus outline):

• Klasične teorije kognitivnega razvoja: Piaget, Vigotski, Brunner: • Novejši pristopi k razlagi miselnega razvoja: neo Piageisti in teorija procesiranja informacij (Pascual-Leone, Case, Fisher, Halford, Demetriou); • Razvoj možganov in učenje; • Zaznavanje in razvoj pozornosti; • Razvoj izvršilnih funkcij in samoregulacije; • Spomin: struktura, delovanje in razvoj; • Razvoj mišljenja: reševanje problemov, presojanje in odločanje, metakognicija; • Inteligentnost: modeli in teorije intelekta, razvoj ustvarjalnosti, koncept modrosti; • Razvoj govora in jezik; • Socialna kognicija in teorija uma; • Razvojni aspekti kognitivno-emocionalne interakcije.	• Classical theories of cognitive development: Piaget, Vigotski, Brunner; • Modern theories of cognitive development: neoPiagetians and information processing theory (Pascual-Leone, Case, Fisher, Halford, Demetriou); • Brain development and learning; • Perception and development of attention; • Development of executive functions and selfregulation; • Memory: structure and development; • Development of thinking: problem solving, judgment and decision making, metacognition; • Intelligence: models and theories of intellect, development of creativity; concept of wisdom; • Language development; • Social cognition and theory of mind; • Developmental aspects of cognitive-emotional interaction

Temeljni literatura in viri / Readings:

Lerner, R. M. and Overton, W. F. (2010). The handbook of life-span development: Cognition, biology, and methods. Hoboken (New Jersey) : J. Willey & Sons
Goswami, U. (2007). Cognitive development: The learning brain. Hove: Psychology Press
Matlin, , M.W. (2005). Cognition. Orlando, Fl.: Harcourt Brace
Sternberg, R. J. (2002). Cognitive Psychology. Wadsworth Publishing
Demetriou, A. & Raftopoulos, A. (2004). Cognitive developmental change: Models, methods, and measurement. Cambridge:
Cambridge University Press.
Članki iz revij kot so: Cognitive Development, Journal of Cognition and Development, Cognitive Psychology, …

Cilji in kompetence:	**Objectives and competences:**
Študentje in študentke: • Poglobljeno spoznajo posamezna področja kognicije in njihov razvoj; • nadgradijo znanje in razumevanje o značilnostih razvoja mišljenja v posameznih obdobjih ter pomenu individualnih razlik; • obvladajo pomembne teorije in modele kognicije ter novejše izsledke na področju kognitivnega razvoja.	Students: • get acquainted with and comprehend different fields of cognitive functioning and their development; • become able to deeply understand characteristics of cognitive development and importance of individual differences; • become able to understand theories and models of cognition and get familiar with new findings in the field of cognitive

	development.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: Poznavanje in poglobljeno razumevanje različnih področij kognicije in njihovega razvoja ter teorij in modelov v kognitivni psihologiji. Prenesljive/ključne spretnosti in drugi atributi: Sposobnost kritične presoje in uporabe znanstvenih in strokovnih spoznanj o kogniciji/ kognitivnem razvoju na področju drugih ved ter v praksi.	Knowledge and Understanding: • Familiarity with and understanding of different areas of cognitive development, and theories and models in cognitive psychology. Transferable/Key • Skills and other attributes: Ability to critically judge and apply scientific and professional findings about cognitive characteristics and development in other fields and in the praxis

Metode poučevanja in učenja:	**Learning and teaching methods:**
• interaktivna predavanja; • razgovor; • obravnava študijskih primerov; • delo z besedilom • multimedijske predstavitve	• interactive lectures; • discussion; • case studies discussion; • working with texts • multimedia presentation

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Način (pisni izpit, ustno izpraševanje, naloge, projekt) seminarska naloga ustni izpit	 30% 70%	Type (examination, oral, coursework, project): coursework oral examination

Reference nosilca / Lecturer's references:

BAKRAČEVIČ VUKMAN, Karin, FUNČIČ MASIČ, Tamara, SCHMIDT, Majda. Self-regulation of learning in secondary school students with special educational needs and other students of vocational and technical schools. The new educational review, ISSN 1732-6729, 2013, vol. 33, no. 3, str. 297-307, tabele. http://www.educationalrev.us.edu.pl/vol/tner_3_2013.pdf. [COBISS.SI-ID 20149256]

BAKRAČEVIČ VUKMAN, Karin, LICARDO, Marta. How cognitive, metacognitive, motivational and emotional self-regulation influence school performance in adolescence and early adulthood. Educational studies, ISSN 0305-5698, July 2010, vol. 36, no. 3, str. 259-268, doi: 10.1080/03055690903180376. [COBISS.SI-ID 17258248],

BAKRAČEVIČ VUKMAN, Karin. Metacognitive accuracy and learning to learn : a developmental perspective. V: LAMANAUSKAS, Vincentas (ur.). Philosophy of mind and cognitive modelling in education - 2012, (Problems of education in the 21st century, ISSN 1822-7864, vol. 46). Siauliai: Scientific Methodological Center Scientia Educologica, 2012, str. 15-21, ilustr. [COBISS.SI-ID 19399176]

BAKRAČEVIČ VUKMAN, Karin, DEMETRIOU, Andreas. Cognitive ability, self-understanding and personality : dynamic interactions in adulthood. Anthropos, ISSN 0587-5161, 2011, letn. 43, št. 1/2, str. 35-50. [COBISS.SI-ID 18590472]

ŠAFHALTER, Andrej, GLODEŽ, Srečko, ABERŠEK, Boris, BAKRAČEVIČ VUKMAN, Karin. Developing spatial ability using 3D modeling in lower secondary school. V: LAMANAUSKAS, Vincentas (ur.). Philosophy of mind and cognitive modelling in education - 2014, (Problems of education in the 21st century, ISSN 1822-7864, vol. 61). Siauliai: Scientific Methodological Center Scientia Educologica, 2014, str. 113-120, ilustr. [COBISS.SI-ID 20936712]

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UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Osebnostni, motivacijski in emocionalni dejavniki vedenja
Course title:	Personality, motivational and emotional factors of behavior

Študijski program in stopnja **Study programme and level**	**Študijska smer** **Study field**	**Letnik** **Academic year**	**Semester** **Semester**
Vedenjska in kognitivna nevroznanost, 3. stopnja		**1. ali 2.**	**1., 3. ali 4.**
Behavioral and Cognitive Neuroscience, 3rd Degree		**1. or 2.**	**1., 3. or 4.**

Vrsta predmeta / Course type	izbirni/elective
Univerzitetna koda predmeta / University course code:	

Predavanja **Lectures**	**Seminar** **Seminar**	**Vaje** **Tutorial**	**Klinične vaje** **work**	**Druge oblike študija**	**Samost. delo** **Individ. work**	**ECTS**
30	**30**				**240**	**10**

Nosilec predmeta / Lecturer:	Katja Košir

Jeziki / Languages:	**Predavanja / Lectures:**	slovenski / slovene
	Vaje / Tutorial:	slovenski / slovene

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisites:**
Pogoji za vključitev v delo: Pogojev ni.	**Prerequisites for attending the course:** None.

Vsebina:	**Content (Syllabus outline):**

1. Sodobne teorije in modeli osebnosti 2. Sodobne teorije in modeli motivacije 3. Merjenje osebnostnih, motivacijskih in emocionalnih značilnosti; vzajemni učinki 4. Medosebne razlike v emocijah in regulaciji emocij 5. Teorija samodoločanja in vloga temeljnih psiholoških potreb pri razumevanju osebnosti in vedenja 6. Paradigma pozitivne psihologije in iz nje izhajajoči psihološki konstrukti: subjektivno zadovoljstvo, optimizem, pozitivna samopodoba, samoregulacija vedenja in emocij, empatija in prosocialno vedenje, intrinzična motivacija, zanos, ustvarjalnost, spoprijemanje s stresom in osebnostna čvrstost 7. Vloga osebnostnih, motivacijskih in emocionalnih dejavnikov v aplikativnih kontekstih; pomen teh vidikov za nevroznanost 8. Dodatne vsebine s področja osebnosti ter motivacijskih in emocionalnih procesov glede na tematiko naloge	1. Contemporary theories and models of personality 2. Contemporary theories and models of motivation 3. Psychological assessment of personality, motivational, and emotional characteristics; reciprocal effects 4. Emotion and emotion regulation: personality processes and individual differences 5. Self-determination theory and the role of basic psychological needs in personality and the organization of behavior 6. Positive psychology approach and related constructs: subjective well-being, optimism, self-regulation of behavior and emotions, empathy and prosocial behavior, intrinsic motivation, flow, creativity, coping with stress and resilience. 7. The role of personality, motivational, and emotional factors in applicative contexts and; the implications for neuroscience 8. Special topics related to personality, motivational and emotional process based on own research problem

Temeljni literatura in viri / Readings:

Gable, S. L., & Haidt, J. (2005). What (and Why) Is Positive Psychology? *Review of General Psychology, 9*, 103–110.

Hirsh, J. B., & Peterson, J. B. (2008). Predicting creativity and academic success with a ‘‘Fake-Proof ” measure of the Big Five. *Journal of Research in Personality, 42*, 1323–1333.

Kaufman, J. C., & Beghetto, R. A. (2009). Beyond big and little: The Four C Model of Creativity. *Review of General Psychology, 13,* 1–12.

Oliver, P. J., Robins, R. W., & Pervin L. A. (Eds.) (2010). *Handbook of Personality. Theory and Research* (3rd ed.). New York: The Guilford Press.

Paunonen, S. W., & Ashton, M. C. (2001). Big five factors and facets and the prediction of behavior. *Journal of Personality and Social Psychology, 81*, 524–539.

Ryan, R. M., Legate, N., Niemiec, C. P., & Deci, E. L. (2012). Beyond illusions and defense: Exploring the possibilities and limits of human autonomy and responsibility through self-determination theory. In P. R. Shaver & M. Mikulincer (Eds.), *Meaning, mortality, and choice: The social psychology of existential concerns* (pp. 215-233). Washington, DC: American Psychological Association.

Ryan, R. M. (Ed.) (2014). *The Oxford Handbook of Human Motivation*. New York: Oxford University Press.
Seligman, M. E. P., Steen, T. A., Park, N., & Peterson, C. (2005). Positive psychology progress. Empirical validation of interventions. *American Psychologist, 60*, 410-421.
Aktualni sodobni članki v znanstveni periodiki/current articles in scientific journals

Cilji in kompetence:

Cilj predmeta je študente seznaniti s ključnimi sodobnimi modeli osebnosti in motivacije ter različnimi pristopi k (merjenju) osebnostnih, motivacijskih in emocionalnih značilnosti. Študenti bodo po izvedbi predmeta poznali ključne teorije in modele osebnosti in motivacije ter razumeli prepletenost osebnostnih, motivacijskih in emocionalnih dejavnikov pri napovedovanju vedenja. Poznali bodo prednosti in pomanjkljivosti različnih pristopov k merjenju osebnostnih, motivacijskih in emocionalnih pojavov ter povezanih psiholoških konstruktov. Prepletenost osebnostnih, motivacijskih in emocionalnih dejavnikov bodo znali pojasniti z različnimi modeli (npr. procesni model odnosov med socialnim kontekstom, selfom, vedenjem in izidi v okviru teorije samodoločanja) in na različnih pojavih (npr. zanos, ustvarjalnost). Pridobljeno znanje bodo znali povezati z lastnimi raziskovalnimi problemi in prenesti v aplikativne kontekste ter na področje nevroznanosti.

Objectives and competences:

The aim of the course is to introduce the students to the basic contemporary approaches to the (measurement of) personality, motivational, and emotional characteristics. After successfully completing the course, students will be familiar with the main theories and models of personality and motivation and will understand the interrelatedness of personality, motivational, and emotional factors in predicting behavior. They will be familiar with the advantages and limitations of different approaches for assessing personality, motivational, and emotional aspects and related psychological constructs. They will be able to explain the interrelatedness between these aspects using different psychological models (e.g. the process model of the relations between social context, self, behavior and outcomes steaming from the self-determination theory) and on different constructs (e.g. flow, creativity). They will be able to relate the acquired knowledge with their own research problems and transfer it into the applied contexts and in neuroscience.

Predvideni študijski rezultati:

Intended learning outcomes:

Znanje in razumevanje: Študenti poznajo in razumejo različne modele osebnosti in motivacije in jih znajo uporabiti pri pojasnjevanju vedenja. Poznajo različne pristope k merjenju osebnostnih, emocionalnih in emocionalnih značilnosti ter njihove prednosti ter omejitve. Naučene modele in pristope znajo uporabiti pri lastnem raziskovalnem delu ter prenesti v aplikativne kontekste ter na področje nevroznanosti.	Knowledge and understanding: Student are familiar with and understand different models of personality and motivation and are able to use them in explaining behavior. They are familiar with different approaches to the assessment of personality, motivational, and emotional characteristics and their strengths and limitations. They are able to use the acquired models and approaches in their own research work and generalize it to the applied contexts and to neuroscience.

Metode poučevanja in učenja:	**Learning and teaching methods:**
Interaktivna predavanja E-učenje Problemsko zastavljene naloge	Interactive frontal method E-learning Problem-based learning exercises

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Ustno izpraševanje	**50%**	Oral examination
Pisne naloge	**50%**	Coursework

Reference nosilca / Lecturer's references:

KOŠIR, Katja, TEMENT, Sara, LICARDO, Marta, HABE, Katarina. Two sides of the same coin? : the role of rumination and reflection in elementary school teachers' classroom stress and burnout. Teaching and teacher education, ISSN 0742-051X. [Print ed.], 2015, vol. 47, str. 131-141, doi: 10.1016/j.tate.2015.01.006.

KOŠIR, Katja, TEMENT, Sara. Teacher-student relationship and academic achievement: a cross-lagged longitudinal study on three different age groups. European journal of psychology of education, ISSN 0256-2928, 2014, vol. 29, iss. 3, str. 409-428, tabele, doi: 10.1007/s10212-013-0205-2.

KOŠIR, Katja, LICARDO, Marta, TEMENT, Sara, HABE, Katarina. Doživljanje stresa in izgorelosti, povezanih z delom z učenci s posebnimi potrebami pri učiteljih v osnovni šoli = Stres and burnout related to work with special education needs students in elementary school teachers. Psihološka obzorja, ISSN 2350-5141. [Spletna izd.], 2014, [Letn.] 23, str. 110-124, tabele. http://psy.ff.uni-lj.si/psiholoska_obzorja/arhiv_clanki/2014/kosir_et_al.pdf.

ZORJAN, Saša, KOŠIR, Katja. Stabilnost samospoštovanja v odnosu do narcisizma in psihološkega blagostanja = Self-esteem stability in relation to narcissism and psychological well-

being. Psihološka obzorja, ISSN 1318-1874. [Tiskana izd.], 2012, letn. 21, št. 3/4, str. 5-14, tabele. http://psy.ff.uni-lj.si/psiholoska_obzorja/arhiv_clanki/2012_3/zorjan_kosir.pdf.

ŠIMEK, Damjan, KOŠIR, Katja. Motivation for participation in competition and avoidance of competition : the role of the accuracy of comparative self-evaluations of academic performance. The new educational review, ISSN 1732-6729, 2015, vol. 39, no. 1, str. 142-152.

MATRIĆ, Maja, KOŠIR, Katja. Perceived autonomy levels among elementary school students and their teachers. The new educational review, ISSN 1732-6729, 2014, vol. 37, no. 3, str. 215-228, tabele. http://www.educationalrev.us.edu.pl/vol/tner_3_2014.pdf.

Univerza v Mariboru

Filozofska fakulteta

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Socialni procesi
Course title:	Social Processes

Študijski program in stopnja **Study programme and level**	**Študijska smer** **Study field**	**Letnik** **Academic year**	**Semester** **Semester**
Vedenjska in kognitivna nevroznanost, 3. stopnja		**1. ali 2.**	**1., 3. ali 4.**
Behavioral and Cognitive Neuroscience, 3rd Degree		**1. or 2.**	**1., 3. or 4.**

Vrsta predmeta / Course type izbirni / elective

Univerzitetna koda predmeta / University course code:

Predavanja **Lectures**	**Seminar** **Seminar**	**Vaje** **Tutorial**	**Klinične vaje** **work**	**Druge oblike študija**	**Samost. delo** **Individ. work**	**ECTS**
30	**30**				**240**	**10**

Nosilec predmeta / Lecturer: Bojan Musil

Jeziki / Languages:	
Predavanja / Lectures:	slovenski / Slovene
Vaje / Tutorial:	slovenski / Slovene

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

Pogoji za vključitev v delo:
Pogojev ni.

Prerequisites:

Prerequisites for attending the course:
None.

Vsebina:

Content (Syllabus outline):

6. Pregled razvoja socialne psihologije. 7. Raziskovanje v socialni psihologiji in analiza podatkov. 8. Pregled področij socialne kognicije in precepcije; stališč; socialnega vplivanja, skupin in medskupinskih procesov; aplikativnih področij socialne psihologije. 9. Teorije v socialni psihologiji. 10. Sodobni pristopi v socialni psihologiji (evolucijski, sociokulturni, socialna nevroznanost).	6. Overview of the development of social psychology. 7. Research in social psychology with data analysis. 8. Overview of social cognition and perception; attitudes; social influence, groups and intergroup processes; applied social psychology. 9. Theories in social psychology. 10. Contemporary approaches in social psychology (evolutionary, sociocultural, social neuroscience).

Temeljni literatura in viri / Readings:

Burke, P. J. (2006). Contemporary Social Psychology Theories. Stanford: Stanford University Press
Cacioppo, J. T. (2006). Social Neuroscience. London : The MIT Press.
Chadee, D. (2011). Theories in Social Psychology. Oxford: Wiley-Blackwell.
Fiske, S. T., Gilbert, D. T., & G. Lindzey (2010). Handbook of Social Psychology (5th ed.). New Jersey: Wiley.
Ruscher, J. B., & Hammer, E. Y. (2004). Current Directions in Social Psychology. Upper Saddle River: Pearson Prentice Hall.
Smith, P. B., Bond, M. H., & Kagitcibasi, C. (2006). Understanding Social Psychology Across Cultures. London: Sage.
Prispevki periodičnih publikacijah (npr. članki v revijah Journal of Personality and Social Psychology, Basic and Applied Social Psychology, Current Research in Social Psychology, European Journal of Social Psychology, Journal of Applied Social Psychology…).

Cilji in kompetence:	**Objectives and competences:**
Cilj predmeta je študente seznaniti z razvojem socialne psihologije, njenih področij, modelov in teorij; in jih vpeljati v socialno psihološko raziskovanje. Študenti bodo znanje in razumevanje nadgradili s sodobnimi pristopi v socialni psihologiji.	The aim of the course is to introduce the students with the development of social psychology, its areas, models and theories; and introduce them to the social psychological research. During this process, students will broaden their knowledge and understanding with contemporary approaches of social psychology.

Predvideni študijski rezultati:	**Intended learning outcomes:**

Znanje in razumevanje: Poznavanje in poglobljeno razumevanje različnih področij, modelov in teorij socialne psihologije.	Knowledge and understanding: Familiarity with and understanding of different areas, models and theories of social psychology.

Metode poučevanja in učenja:	**Learning and teaching methods:**
Interaktivna predavanja Razgovor Obravnava študijskih primerov Delo z besedilom Multimedijske predstavitve	Interactive lectures Discussion Case studies discussion Work with texts Multimedia presentations

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Ustno izpraševanje	**50%**	Oral examination
Projekt	**50%**	Project

Reference nosilca / Lecturer's references:

MUSIL, Bojan. *Sociokulturna psihologija*, (Mednarodna knjižna zbirka Zora, 70). V Mariboru: Filozofska fakulteta, Mednarodna založba Oddelka za slovanske jezike in književnosti, 2010. 157 str. ISBN 978-961-6656-48-1. [COBISS.SI-ID 65497857]

MUSIL, Bojan, LAVRIČ, Miran. Values, sustainable social functioning and visions of the future. V: LAVRIČ, Miran (ur.), et al. *Youth 2010 : the social profile of young people in Slovenia*. 1st ed. Ljubljana: Ministry of Education and Sports, Office for Youth; Maribor: Aristej, 2011, str. 419-448, ilustr. [COBISS.SI-ID 18696456]

MUSIL, Bojan. Basic shifts in value orientations in post-Yugoslav region : convergence or divergence?. V: FLERE, Sergej (ur.), et al. *20 years later : problems and prospects of countries of former Yugoslavia*. Maribor: Center for the Study of Post-Yugoslav Societes, Faculty of Arts, 2013, str. 201-221, ilustr. [COBISS.SI-ID 19740424]

MUSIL, Bojan. Posameznik vs. družba ali skupnost? : slovenski subjekt v kontekstu. V: NATERER, Andrej (ur.). *Mladi 2010*, (Frontier, 054), (Subkulture, št. 10). Maribor: Subkulturni azil, 2011, str. 8-21, ilustr. [COBISS.SI-ID 18870792]

PERRY, John L., MCKAY, Michael T., WORRELL, Frank C., ŽIVKOVIČ, Urška, MELLO, Zena R., MUSIL, Bojan. Measuring time perspective in adolescents : can you get the right answer by asking the wrong questions?. *Personality and Individual Differences*, ISSN 0191-8869. [Print ed.], May 2015, vol. 78, str. 53-57, doi: 10.1016/j.paid.2015.01.015. [COBISS.SI-ID 21149192]

MUSIL, Bojan, TEMENT, Sara, BAKRAČEVIČ VUKMAN, Karin, ŠOŠTARIČ, Ajda. Aggression in school and family contexts among youngsters with special needs : qualitative and quantitative evidence from the TranSpace project. *Children and youth services review*, ISSN 0190-7409, September 2014, vol. 44, str. 46-55, ilustr., doi: 10.1016/j.childyouth.2014.06.005. [COBISS.SI-ID 20723208]

MUSIL, Bojan. Študije vrednot v medkulturnem raziskovanju. V: FIŠTRAVEC, Andrej (ur.), NATERER, Andrej (ur.). *Subkulture : prispevki za kritiko in analizo družbenih gibanj*, (Frontier, 020; 024; 027; 033; 042; 047; 049). Maribor: Subkulturni azil, 2002-<2010>, zv. 6/7, str. 132-170, graf. prikazi. [COBISS.SI-ID 16099080]

Univerza v Mariboru

Filozofska fakulteta

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Organizacijsko vedenje
Course title:	Organizational behavior

Študijski program in stopnja **Study programme and level**	**Študijska smer** **Study field**	**Letnik** **Academic year**	**Semester** **Semester**
Vedenjska in kognitivna nevroznanost, 3. stopnja		**1. ali 2.**	**1., 3. ali 4.**
Behavioral and Cognitive Neuroscience, 3rd Degree		**1. or 2.**	**1., 3. or 4.**

Vrsta predmeta / Course type	izbirni/elective
Univerzitetna koda predmeta / University course code:	

Predavanja **Lectures**	**Seminar** **Seminar**	**Vaje** **Tutorial**	**Klinične vaje** **work**	**Druge oblike študija**	**Samost. delo** **Individ. work**	**ECTS**
30	**30**				**240**	**10**

Nosilec predmeta / Lecturer:	Sara Tement

Jeziki / Languages:	**Predavanja / Lectures:**	slovenski / slovene
	Vaje / Tutorial:	slovenski / slovene

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisites:**
Pogoji za vključitev v delo: Pogojev ni. **Pogoji za opravljanje študijskih obveznosti**: Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno. Pozitivna ocena iz problemsko zastavljenih pisnih nalog je pogoj za pristop k ustnemu izpitu.	**Prerequisites for attending the course:** None. **Prerequisites for completing the course:** Each of the mentioned commitments must be assessed with a passing grade. Passing grade of the problem-based learning exercises is required for taking the oral examination.

Vsebina:	**Content (Syllabus outline):**

11. Posameznik v organizaciji - Zaznavanje in odločanje - Emocije in osebnostne značilnosti - Motivacija - Stališča do dela - Stres, izgorelost in psihično blagostanje 12. Skupine v organizaciji - Konflikti in komunikacija - Delovni timi 13. Organizacija kot celota - Vodenje - Organizacijska klima/kultura 14. Dodatne vsebine glede na tematiko naloge: Organizacijska nevroznanost, Izbrane teme psihologije dela	1. Foundations of individual behavior - Perception and decision making - Emotions and personality traits - Motivation - Attitudes in the workplace - Stress, burnout and well-being 2. Groups in organizations - Conflict and communication - Work teams 3. Organizational processes - Leadership - Organizational climate/culture 4. Special topics based on own research problem: Organizational neuroscience, topics from work psychology

Temeljni literatura in viri / Readings:

Arnold, J., Randall, R. et al. (2010). Work psychology: Understanding human behaviour in the workplace, 5th edition. Harlow: Prentice Hall.
Muchinsky, P. (2012). Psychology Applied to Work. Summerfield, NC: Hypergraphic Press.
Riggio, R. E. (2013). Introduction to Industrial/Organizational Psychology 6th Edition. Upper Saddle River, NJ: Pearson Education.
Robbins, S. P., Judge, T. A., & Campbell, T. T. (2010). Organizational behavior. Harlow, UK: Pearson Education.
Prispevki periodičnih publikacijah (npr. članki v revijah Journal of Organizational Behavior, Journal of Vocational Behavior, Journal of Occupational Health Psychology, Journal of Applied Psychology, Journal of Management itd.).

Cilji in kompetence:	**Objectives and competences:**
Cilj predmeta je študente seznaniti z glavnimi temami, ki jih pokrivajo področja organizacijskega vedenja, psihologije dela ter kadrovske in organizacijske psihologije. Po izvedbi predmeta bodo študenti razumeli vedenje ljudi znotraj delovnih organizacij in znali samostojno razviti raziskovalna vprašanja, vezana na eksperimentalne načrte ali korelacijske študije. Predmet študente spodbuja k samostojni zasnovi raziskav vedenja ljudi pri delu in ustvarjalnega združevanja novih (npr. organizacijska	The aim of the course is to introduce the students to the basic topics covered by the fields of organizational behavior, work psychology, personnel, and organizational psychology. After successfully completing the course, students will understand individual and group behavior at work and will be able to independently develop research questions related to experimental and correlational studies. The course will encourage students to independently design studies related to organizational behavior and to combine new

nevroznanost) in starejših perspektiv (npr. pristranskosti v odločanju pri delu).	(e.g., organizational neuroscience) and older perspectives (e.g., decision making biases) in a creative way.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: Študenti razumejo osnove organizacijskega vedenje in znajo znanje uporabiti pri pripravi izvirnih raziskovalnim vprašanj na tem področju. Študenti bodo znanje in razumevanje nadgradili s sodobnimi pristopi v organizacijskem vedenju, psihologiji dela, kadrovski in organizacijski psihologiji.	Knowledge and understanding: Student understand the basics of organizational behavior and are able to apply this knowledge when developing creative research questions from this field. During this process, students will broaden their knowledge and understanding with contemporary approaches in organizational behavior, work psychology, personnel, and organizational psychology.

Metode poučevanja in učenja:	**Learning and teaching methods:**
Interaktivna predavanja E-učenje Problemsko zastavljene naloge	Interactive frontal method E-learning Problem-based learning exercises

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Ustno izpraševanje	**50%**	Oral examination
Pisne naloge	**50%**	Coursework

Reference nosilca / Lecturer's references:

SEDLAR, Nataša, ŠPRAH, Lilijana, TEMENT, Sara, SOČAN, Gregor. Internal structure of an alternative measure of burnout : study on the Slovenian adaptation of the Oldenburg Burnout Inventory (OLBI). Burnout research, ISSN 2213-0586, Available online 20 February 2015, str. 1-7. http://www.sciencedirect.com/science/article/pii/S2213058615000029#, doi: 10.1016/j.burn.2015.02.001. [COBISS.SI-ID 21193736]

TEMENT, Sara, KORUNKA, Christian. The moderating impact of types of caregiving on job demands, resources, and their relation to work-to-family conflict and enrichment. Journal of family issues, ISSN 0192-513X, 2015, 36, no. 1, str. 31-55, doi: 10.1177/0192513X13483971. [COBISS.SI-ID 19825416]

KOŠIR, Katja, TEMENT, Sara, LICARDO, Marta, HABE, Katarina. Two sides of the same coin? : the role of rumination and reflection in elementary school teachers' classroom stress and burnout. Teaching and teacher education, ISSN 0742-051X. [Print ed.], 2015, vol. 47, str. 131-141, doi: 10.1016/j.tate.2015.01.006. [COBISS.SI-ID 21087240]

MUSIL, Bojan, TEMENT, Sara, BAKRAČEVIČ VUKMAN, Karin, ŠOŠTARIČ, Ajda. Aggression in school and family contexts among youngsters with special needs : qualitative and quantitative evidence from the TranSpace project. Children and youth services review, ISSN 0190-7409, September 2014, vol. 44, str. 46-55, ilustr., doi: 10.1016/j.childyouth.2014.06.005. [COBISS.SI-ID 2072320]

KOŠIR, Katja, TEMENT, Sara. Teacher-student relationship and academic achievement: a cross-lagged longitudinal study on three different age groups. European journal of psychology of education, ISSN 0256-2928, 2014, vol. 29, iss. 3, str. 409-428, tabele, doi: 10.1007/s10212-013-0205-2. [COBISS.SI-ID 20083208]

KUBICEK, Bettina, KORUNKA, Christian, TEMENT, Sara. Too much job control? : two studies on curvilinear relations between job control and eldercare workers' well-being. International journal of nursing studies, ISSN 0020-7489. [Print ed.], dec. 2014, 51, [no.] 12, str. 1644-1653, ilustr., doi: 10.1016/j.ijnurstu.2014.05.005. [COBISS.SI-ID 20567816]

TEMENT, Sara. The role of personal and key resources in the family-to-work enrichment process. Scandinavian journal of psychology, ISSN 0036-5564, Oct. 2014, vol. 55, iss. 5, str. 489-496, ilustr., doi: 10.1111/sjop.12146. [COBISS.SI-ID 20723720]

TEMENT, Sara, KORUNKA, Christian. Does trait affectivity predict work-to-family conflict and enrichment beyond job characteristics?. The Journal of psychology, ISSN 0022-3980, 2013, vol. 147, no. 2, str. 197-216, tabele, doi: http://dx.doi.org/10.1080/00223980.2012.683053. [COBISS.SI-ID 19618056]

RANTANEN, Johanna, KINNUNEN, Ulla, MAUNO, Saija, TEMENT, Sara. Patterns of conflict and enrichment in work-family balance : a three-dimensional typology. Work and stress, ISSN 0267-8373, 2013, vol. 27, no. 2, str. 141-163, doi: 10.1080/02678373.2013.791074. [COBISS.SI-ID 19868168]

Univerza v Mariboru

Filozofska fakulteta

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Psihologija virtualnih prostorov
Course title:	Psychology of Cyberspace

Študijski program in stopnja **Study programme and level**	**Študijska smer** **Study field**	**Letnik** **Academic year**	**Semester** **Semester**
Vedenjska in kognitivna nevroznanost, 3. stopnja		**1. ali 2.**	**1., 3. ali 4.**
Behavioral and Cognitive Neuroscience, 3rd Degree		**1. or 2.**	**1., 3. or 4.**

Vrsta predmeta / Course type	izbirni/elective
Univerzitetna koda predmeta / University course code:	

Predavanja **Lectures**	**Seminar** **Seminar**	**Vaje** **Tutorial**	**Klinične vaje** **work**	**Druge oblike študija**	**Samost. delo** **Individ. work**	**ECTS**
30	**30**				**240**	**10**

Nosilec predmeta / Lecturer:	Nenad Čuš Babić

Jeziki / Languages:	**Predavanja / Lectures:**	slovenski/Slovene
	Vaje / Tutorial:	slovenski/Slovene

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisites:**
Pogoji za vključitev v delo: Poznavanje osnovnih konceptov psihologije osebnosti in socialne psihologije.	**Prerequisites for attending the course**: Knowledge of basic concepts in personality nad social psychology.

Vsebina:	**Content (Syllabus outline):**

• Opredelitev področja • Posameznik vpliv uporabe tehnologije na telo in možgane; vprašanja sebstva, osebne in socialne identitete; razvoj posameznika; razumevanje spola; upravljanje z vtisom • Skupine nastanek virtualnih skupnosti; skupinska dinamika; skupinska kohezija; socialna resničnost v virtualnem svetu • Komunikacija socialna omrežja; teoretični modeli spletne komunikacije; uporaba mobilnih naprav, razvoj jezika; uporaba slike; komunikacija s stroji • Patološki pojavi nasilje, depresija, narcisizem, odvisnosti • Pojavi virtualnega sveta nevidnost, brezčasnost, 3D svetovi, avatarji, večopravilnost, umetna inteligenca • Druga poglavja iz interakcije med človekom in računalnikom	• Introduction to cyberpsychology • Individual technology influences on body and brain; self, personal and social identity; development process; understanding of gender; impression management • Groups virtual communities; group dynamics; group cohesion; social reality in virtual world • Communication social networks; theoretical models of online communication; mobile devices; language development; images; communication with machines • Pathology violence, depression, narcissism, addictions • Cyberspace phenomena invisibility, timeless, 3D worlds, avatars, multitasking, artificial intelligence • Other topics in human computer interaction

Temeljni literatura in viri / Readings:

Rosen, L. D., Cheever, N. A., & Carrier, L. M. (Eds.). (2015). *The Wiley Handbook of Psychology, Technology, and Society*. Wiley Blackwell.

Sundar, S. S. (Eds.). (2015). *The Handbook of the Psychology of Communication Technology*. Wiley Blackwell.

Carvalheiro, J. R., & Tellería, A. S. (Eds.). (2015). *Mobile and Digital Communication: Approaches to Public and Private*. *Core Sociological Dichotomies*. Livros LabCom.

Gackenbach, J. (Ed.). (2007). *Psychology and the Internet: Intrapersonal, interpersonal, and transpersonal implications (2nd ed.)*. Academic Press.

Turkle, S. (2011). *Alone Together*. New York: Basic Books.

Boyd, d. (2014). *It's Complicated: The Social Lives of Networked Teens*, 296.

Cilji in kompetence:	**Objectives and competences:**
Cilj predmeta je študenta seznaniti s celovitim pregledom učinkov uporabe informacijskih tehnologij, kot so računalniki, omrežja, roboti in umetna inteligenca, na vedenje, psihološke značilnosti in duševne procese posameznika ter delovanje skupin. Predstavljeni bodo ključni psihološki koncepti relevantni za obravnavo posameznika, socialne interakcije podprte z informacijsko tehnologijo ter interakcije med človekom in stroji. Predmet razvija kompetence na področju raziskovanja psiholoških fenomenov povezanih z uporabo računalniških tehnologij, aplikacije ustreznih raziskovalnih metod, analize uporabe informacijskih tehnologij ter kritičnega mišljenja o vplivih tehnologije na psihologijo in življenje človeka.	The aim of this module is to introduce the students with an overview of information technology, networks, robots and artificial intelligence implications on human behaviour, psychological consequences and group functioning. The student will be introduced with key psychological concepts relevant for understanding of individuals, social interactions and human-machine interactions. This module broadens competences in the field of exploration of psychological phenomena related to information technology, application of appropriate research methods, analysis of technology applications and critical thinking about influences of IT on psychology and human life.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: Pozna in razume relevantne teorije ter ima pregled nad problemi na področju psihologije virtualnih prostorov, vedenja ter socialnih interakcij v virtualnih okoljih. Prepoznava razlike v vedenju znotraj in izven virtualnega okolja. Uporaba in analiza: Skozi uporabo in primerjavo relevantnih teorij analizira vedenje posameznikov in skupin v povezavi z rabo informacijskih tehnologij ter pojasnjuje opažena vedenja in posledice rabe tehnologij. Sinteza in vrednotenje: S psihološkega stališča kritično vrednoti pomen sprememb v razvoju informacijskih tehnologij in vrednoti ter predvideva pojave vedenj v virtualnih okoljih.	Knowledge and understanding: Knows and understands relevant theories and lists problems in the field of cyberpsychology. Recognises behavioural differences between online and offline environments. Use and analysis: Using relevant theoretical background student is able to analyse behaviour of individuals and groups, explains identified behaviour and consequences of use of information technology. Synthesis and evaluation: Critically evaluates influences of changes in IT development from psychology viewpoint. Evaluates and foresees behaviour in cyberspace. Transferable/Key Skills and other attributes: Student obtains practical skills using different IT

	tools, applications and virtual environments. Student is able to provide counselling with regard to technological innovations and usage of IT in general.

Metode poučevanja in učenja:	**Learning and teaching methods:**
• delo z besedilom • razprava z obravnavo študijskih primerov in prebrane literature • analiza konkretnih primerov in razlage primerov pojavov v virtualnem okolju • pisanje esejev s kritičnim vrednotenjem besedil	• Work with texts • Discussions of literature and case studies • Analysis and explanations of online phenomena • Writing essays with critical evaluation of given texts

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Način (pisni izpit, ustno izpraševanje, naloge, projekt)		Type (examination, oral, coursework, project):
Eseji	30	Essays
Sprotna ustna preverjanja	30	Weekly discussions
Seminarska naloga	40	Coursework

Reference nosilca / Lecturer's references:

MUSIL, Bojan, PREGLEJ, Andrej, ČUŠ BABIČ, Nenad, ROPERT, Tadevž. Self-reflection and webcams: : self-awareness in the context of computer-mediated communication. Review of Psychology, ISSN 1330-6812, 2014, vol. 21, no. 1, str. 72-73. http://mjesec.ffzg.hr/revija.psi/vol%2021%20no%201%202014/special.pdf.

PREGLEJ, Andrej, MUSIL, Bojan, ČUŠ BABIČ, Nenad, ROPERT, Tadevž. Sebstvo in spletne kamere : samozavedanje v kontekstu računalniško posredovane komunikacije. Psihološka obzorja, ISSN 2350-5141. [Spletna izd.], 2014, letn. 23, str. 82-83. http://psy.ff.uni-lj.si/psiholoska_obzorja/arhiv_clanki/2014/rostoharjevi_dnevi_2014.pdf.

ČUŠ BABIČ, Nenad, REBOLJ, Danijel, NEKREP, Matjaž P., PODBREZNIK, Peter. Supply-chain transparency within industrialized construction projects. Computers in industry, ISSN 0166-3615. [Print ed.], Feb. 2014, iss. 2, vol. 65, str. 345-353

ČUŠ BABIČ, Nenad, PODBREZNIK, Peter, REBOLJ, Danijel. Integrating resource production and construction using BIM. Automation in construction, ISSN 0926-5805. [Print ed.], Aug. 2010, vol. 19, iss. 5, str. 539-543

Univerza v Mariboru

Filozofska fakulteta

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Biofizika
Course title:	Biophysics

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Vedenjska in kognitivna nevroznanost, 3. stopnja		**1. ali 2.**	**1., 3. ali 4.**
Behavioral and Cognitive Neuroscience, 3rd Degree		**1. or 2.**	**1., 3. or 4.**

Vrsta predmeta / Course type	izbirni/elective
Univerzitetna koda predmeta / University course code:	

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
30	**30**				**240**	**10**

Nosilec predmeta / Lecturer:	Milan Brumen

Jeziki / Languages:	**Predavanja / Lectures:**	slovenski / slovene
	Vaje / Tutorial:	slovenski / slovene

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisites:**
Pogoji za vključitev v delo: Jih ni. Pogoji za opravljanje študijskih obveznosti: Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno.	Prerequisites for attending the course: None. Prerequisites for completing the course: Each of the mentioned commitments must be assessed with a passing grade.

Vsebina:	**Content (Syllabus outline):**
Kemijske vezi in medmolekularne interakcije ter struktura bioloških makromolekul in supramolekularnih kompleksov. Vezava ligandov in alosterični pojavi. Voda, njena struktura in pomen za biološke sisteme. Biofizika celične membrane in celice: osmozne lastnosti in kislinsko-bazno ravnotežje, metabolizem celice, mehanske lastnosti celične membrane, transport preko celične membrane, električna vzdražljivost celice in prenos električnega impulza. Biofizika celičnega skeleta in molekularnih strojev subceličnih dimenzij	Chemical bonding, intermolecular interactions and structure of biological macromolecules and supramolecular systems. Binding of ligands and allosteric phenomena. Structure of water and its meaning for biological systems. Cell and cell membrane biophysics: osmotic properties, acid-base equilibrium, metabolism, mechanical properties of a cell membrane, membrane transport, electrical excitability and propagation of electric pulse. Biophysics of cytoskeleton and molecular motors. Selected physiological systems:

(delovanje mišice). Izbrani fiziološki sistemi: kri in krvni obtok, čutila, okostje in mišice, živčevje. Regulacija bioloških sistemov (sistemska analiza, regulacija metaboličnih sistemov - kontrolna teorija). Biološki dinamični sistemi (celična signalizacija, razvoj populacije). Samoorganizacija bioloških sistemov. Teorije in modeli evolucije. Interakcija neionizirajočega elektromagnetnega sevanja s humanim tkivom. Interakcija ionizirajočega sevanja s humanim tkivom. Pregled eksperimentalnih biofizikalnih metod. Pregled osnovnih konceptov statistične termodinamike s poudarkom na obravnavi bioloških sistemov.	blood and cardiovascular system; senses, skeletal-muscular system, nervous system. Regulation of biological systems (system analysis, control theory of metabolic systems). Biological dynamic systems (cell signalling, evolution of population). Self-organisation of biological systems. Theory and models of evolution. Interaction of non-ionising electromagnetic radiation with human tissue. Interaction with ionising radiation with human tissue. Overview of experimental methods in biophysics. Overview of basic concepts in statistical thermodynamics applied to biological systems.

Temeljni literatura in viri / Readings:

- A.H. Zewail: Physical Biology. From atoms to medicine, Imperial College Press 2008
- B.H. Brown, R.H. Smallwood, D.C. Barber, P.V. Lawford, D.R. Hose: Medical physics and biomedical engineering, Institute of Physics Publishing 2001
- R. Glaser: Biophysics, Springer 1999

Cilji in kompetence:	**Objectives and competences:**
Cilj predmeta je obravnavati strukturo in funkcijo bioloških sistemov oziroma njihovih gradnikov na molekularni in makromolekularni ravni, na stopnji supramolekularne organiziranosti, na ravni celice in interakcije med njimi ter na ravni organov človeškega telesa. Pristop temelji na matematični formulaciji konceptov v biofiziki. Obravnavani primeri so izbrani iz humane biologije in zato posebej zanimivi za medicino.	The main objective of the course is to discuss the structure and function of biological systems on different levels of biological complexity from a molecular, macromolecular and supramolecular level to a cellular level and tissue as well as to organs of the human body. The course is based on mathematical formulation of biophysical concepts. In particular, systems presented are selected from human biology and, therefore, they are applicable to medicine.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: Osvojeno pregledno interdisciplinarno znanje o strukturnih lastnosti in delovanju bioloških sistemov na različnih ravneh organiziranosti od molekule do organizma. Prenesljive/ključne spretnosti in drugi atributi: Sposobnost vključitve v poglobljeno raziskovalno delo z namenom nadaljevanja doktorskega študija in izdelave doktorata na različnih problemih kognitivne nevroznanosti.	Knowledge and understanding: Broad interdisciplinary knowledge of structure and function of different biological systems considered at different levels of complexity from molecules to human organs. Transferable/Key Skills and other attributes: Ability of a student to be involved deeply in research in order to continue his/her doctoral studies leading to PhD thesis on various problems from biomedicine.

Metode poučevanja in učenja:	Learning and teaching methods:
• predavanja • seminarji	• lectures • seminars

Načini ocenjevanja:	Delež (v %) / Weight (in %)	Assessment:
Način (pisni izpit, ustno izpraševanje, naloge, projekt) Ustno izpraševanje Seminarska naloga	50% 50%	Type (examination, oral, coursework, project): Oral examination Coursework

Reference nosilca / Lecturer's references:

FAJMUT, Aleš, EMERŠIČ, Tadej, DOBOVIŠEK, Andrej, ANTIĆ, Nataša, SCHÄFER, Dirk, BRUMEN, Milan. Dynamic model of eicosanoid production with special reference to non-steroidal anti-inflammatory drug-triggered hypersensitivity. IET systems biology, ISSN 1751-8849. [Print ed.], 2015, str. 1-12, doi: 10.1049/iet-syb.2014.0037.

UREVC, Janez, BRUMEN, Milan, FLIS, Vojko, ŠTOK, Boris. Applying thermomechanical analogy to predict the arterial residual stress state. Strojniški vestnik, ISSN 0039-2480, Jan. 2015, vol. 61, no. 1, str. 5-23, ilustr., doi: 10.5545/sv-jme.2014.2061.

DOBOVIŠEK, Andrej, FAJMUT, Aleš, BRUMEN, Milan. Strategy for NSAID administration to aspirin-intolerant asthmatics in combination with PGE [sub] 2 analogue: a theoretical approach. Medical & biological engineering & computing, ISSN 0140-0118. [Print ed.], 2012, vol. 50, no. 1, str. 33-42, doi: 10.1007/s11517-011-0844-x.

BOHINC, Klemen, SHRESTHA, Ahis, BRUMEN, Milan, MAY, Sylvio. Poisson-Helmholtz-Boltzmann model of the electric double layer : analysis of monovalent ionic mixtures. Physical review. E, Statistical, nonlinear, and soft matter physics, ISSN 1539-3755, 2012, vol. 85, no. 3, str. 031130-1-031130-12, doi: 10.1103/PhysRevE.85.031130.

DOBOVIŠEK, Andrej, ŽUPANOVIĆ, Paško, BRUMEN, Milan, BONAČIĆ LOŠIĆ, Željana, KUIĆ, Domagoj, JURETIĆ, Davor. Enzyme kinetics and the maximum entropy production principle. Biophysical chemistry, ISSN 0301-4622. [Print ed.], 2011, vol. 154, iss. 2/3, str. 49-55, doi: 10.1016/j.bpc.2010.12.009.

DOBOVIŠEK, Andrej, FAJMUT, Aleš, BRUMEN, Milan. Role of expression of prostaglandin synthases 1 and 2 and leukotriene C [sub] 4 synthase in aspirin-intolerant asthma: a theoretical study. Journal of pharmacokinetics and pharmacodynamics, ISSN 1567-567X, 2011, vol. 38, no. 2, str. 261-278, doi: 10.1007/s10928-011-9192-6.

ŽUPANOVIĆ, Paško, KUIĆ, Domagoj, BONAČIĆ LOŠIĆ, Željana, PETROV, Dražen, JURETIĆ, Davor, BRUMEN, Milan. The maximum entropy production principle and linear irreversible processes. Entropy, ISSN 1099-4300, 2010, vol. 12, no. 5, str. 996-1005, doi: 10.3390/e12050996.

Univerza v Mariboru

Filozofska fakulteta

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Psihofarmakologija
Course title:	Psychopharmacology

Študijski program in stopnja **Study programme and level**	**Študijska smer** **Study field**	**Letnik** **Academic year**	**Semester** **Semester**
Vedenjska in kognitivna nevroznanost, 3. stopnja		**1. ali 2.**	**1., 3. ali 4.**
Behavioral and Cognitive Neuroscience, 3rd Degree		**1. or 2.**	**1., 3. or 4.**

Vrsta predmeta / Course type izbirni/elective

Univerzitetna koda predmeta / University course code:

Predavanja **Lectures**	**Seminar** **Seminar**	**Vaje** **Tutorial**	**Klinične vaje** **work**	**Druge oblike študija**	**Samost. delo** **Individ. work**	**ECTS**
30	**30**				**240**	**10**

Nosilec predmeta / Lecturer: Uroš Maver

Jeziki / Languages:	
Predavanja / Lectures:	slovenski / slovene
Vaje / Tutorial:	slovenski / slovene

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisites:**
Pogoji za vključitev v delo: Osnovna znanja iz biologije, kemije, ter anatomije in fiziologije. **Pogoji za opravljanje študijskih obveznosti**: Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno. Pozitivna ocena iz seminarjev je pogoj za pristop k izpitu.	**Prerequisites for attending the course:** Knowledge of biology, chemistry, and anatomy and physiology. **Prerequisites for completing the course:** Each of the mentioned commitments must be assessed with a passing grade. Passing grade for the seminars is required for attending the final exam.

Vsebina:	**Content (Syllabus outline):**

1. Osnove splošne farmakologije 15. Farmakodinamika in farmakokinetika 16. Molekularna farmakologija in kemijski mediatorji 2. Osnove o psihozah in psihiatričnih motnjah • Anksioznost • Depresija • Bipolarna motnja • Obsesivne motnje • Druge 3. Zdravila s psihotropnimi učinki: 17. Anksiolitiki 18. Antidepresivi 19. Antipsihotiki 20. Antikonvulzivi 21. Psihostimulansi	1. Principles in general pharmacology: • Pharmacodynamics and pharmacokinetics • molecular pharmacology and chemical mediators 2. Principles of psychosis and mental disorders: • Anxiety • Depression • Bipolar disorder • Obsessive disorders • Others 3. Psychotropic medication: • Anxiolytics • Antidepressants • Antipsychotics • Anticonvulsants • Psychostimulants

Temeljni literatura in viri / Readings:

Rang HP, Dale M, Ritter JM, Moore PK. Pharmacology. 7th edition (ali novejša). Edinburgh: Churchill Livingstone; 2012.
Lüllmann H, Hein L, Mohr K. Pocket Atlas of Pharmacology, 4th edition (ali novejša): Thieme, Stuttgart/New York; 2010.

Cilji in kompetence:	**Objectives and competences:**
• spoznati osnove mehanizma delovanja zdravil, vpliv zdravil na organizem in vpliv organizma na zdravila • pridobiti pregledno znanje o psihotropnih zdravilih in boleznih, ki jih zdravijo	• to acquire knowledge on basic mechanisms of drug actions and the fate of drugs in the human body • to get an overview of the most important psychotropic drugs and the diseases they are prescribed to treat

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: • spoznati osnovne mehanizme delovanja zdravil, vpliv zdravil na organizem in vpliv organizma na zdravila • pridobiti pregledno znanje o psihotropnih zdravilih in boleznih, ki jih zdravijo • povezovanje pričakovanih učinkov, koristnih in škodljivih	**The students gain fundamental knowledge on:** • to acquire knowledge on basic mechanisms of drug actions and the fate of drugs in the human body • to get an overview of the most important psychotropic drugs and the diseases they are prescribed to treat • linking the expected drug effects, useful and

• sposobnost kritično uporabljati relevantne literaturne vire na področju psihofarmakologije	harmful • the ability of critical usage of relevant literature sources in the field of psychopharmacology

Metode poučevanja in učenja:	**Learning and teaching methods:**
Interaktivna predavanja Seminarji	Interactive frontal method Seminars

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Seminar	**50%**	Seminar
Izpit	**50%**	Examination

Reference nosilca / Lecturer's references:

MAVER, Tina, **MAVER, Uroš**, STANA-KLEINSCHEK, Karin, SMRKE, Dragica, KREFT, Samo. A review of herbal medicines in wound healing. *International journal of dermatology,* ISSN 0011-9059. [Print ed.], Article first published online: 24 Mar. 2015, vol. 54, iss. 7, str. 740-751.

MAVER, Tina, **MAVER, Uroš**, STANA-KLEINSCHEK, Karin, MLINARIČ-RAŠČAN, Irena, SMRKE, Dragica. Advanced therapies of skin injuries. *Wiener klinische Wochenschrift*, ISSN 1613-7671, str. [1-12].

EHMANN, Heike M. A., BREITWIESER, Doris, WINTER, Sascha, GSPAN, Christian, KORAIMANN, Günther, **MAVER, Uroš**, ŠEGA, Marija, KÖSTLER, Stefan, STANA-KLEINSCHEK, Karin, SPIRK, Stefan, RIBITSCH, Volker. Gold nanoparticles in the engineering of antibacterial and anticoagulant surfaces. *Carbohydrate polymers*, ISSN 0144-8617. [Print ed.], 2015, vol. 117, str. 34-42.

MAVER, Tina, **MAVER, Uroš**, MOSTEGEL, Florian, GRIEßER, Thomas, SPIRK, Stefan, SMRKE, Dragica, STANA-KLEINSCHEK, Karin. Cellulose based thin films as a platform for drug release studies to mimick wound dressing materials. *Cellulose*, ISSN 0969-0239, Feb. 2015, vol. 22, iss. 1, str. 749-761.

MAVER, Tina, KUREČIČ, Manja, SMRKE, Dragica, STANA-KLEINSCHEK, Karin, **MAVER, Uroš**. Electrospun nanofibrous CMC/PEO as a part of an effective pain relieving wound dressing. *Journal of sol-gel science and technology*, ISSN 0928-0707, First online: 12 October 2015, vol. , iss. , str. 1-12.

MAVER, Uroš, BELE, Marjan, JAMNIK, Janko, GABERŠČEK, Miran, PLANINŠEK, Odon. A fast and simple method for preparation of calcium carbonate-drug composites for fast drug release. *Materials research bulletin*, ISSN 0025-5408. [Print ed.], 2013, vol. 48, no. 1, str. 137-145.

UKMAR GODEC, Tina, **MAVER, Uroš**, PLANINŠEK, Odon, PINTAR, Albin, KAUČIČ, Venčeslav, GODEC, Aljaž, GABERŠČEK, Miran. Guest-host van der Waals interactions decisively affect the molecular transport in mesoporous media. *Journal of materials chemistry*, ISSN 0959-9428. [Print ed.], 2012, vol. 22, no. 3, str. 1112-1120.

ŽUŽEK ROŽMAN, Kristina, PEČKO, Darja, ŠTURM, Sašo, **MAVER, Uroš**, NADRAH, Peter, BELE, Marjan, KOBE, Spomenka. Electrochemical synthesis and characterization of Fe[sub](70)Pd[sub](30) nanotubes for drug-delivery applications. *Materials chemistry and physics*, ISSN 0254-0584. [Print ed.], 2012, vol. 133, issue 1, str. 218-224.

UKMAR GODEC, Tina, **MAVER, Uroš**, PLANINŠEK, Odon, KAUČIČ, Venčeslav, GABERŠČEK, Miran, GODEC, Aljaž. Understanding controlled drug release from mesoporous silicates : theory and experiment. *Journal of controlled release*, ISSN 0168-3659. [Print ed.], 2011, vol. 155, issue 3, str. 409-417.

MAVER, Uroš, ŽNIDARŠIČ, Andrej, GABERŠČEK, Miran. An attempt to use atomic force microscopy for determination of bond type in lithium battery electrodes. *Journal of materials chemistry*, ISSN 0959-9428. [Print ed.], 2011, vol. 21, no. 12, str. 4071-4075.

HRIBAR, Gorazd, ŽNIDARŠIČ, Andrej, BELE, Marjan, **MAVER, Uroš**, CASERMAN, Simon, GABERŠČEK, Miran, GABERC-POREKAR, Vladka. Zinc-phosphate nanoparticles with reversibly attached TNF-[alfa] analogs : an interesting concept for potential use in active immunotherapy. *Journal of nanoparticle research*, ISSN 1388-0764, 2011, vol. 13, no. 7, str. 3019-3032.

MAVER, Uroš, BELE, Marjan, MAKOVEC, Darko, ČAMPELJ, Stanislav, JAMNIK, Janko, GABERŠČEK, Miran. Incorporation and release of drug into/from superparamagnetic iron oxide nanoparticles. *Journal of Magnetism and Magnetic Materials*, ISSN 0304-8853. [Print ed.], 2009, vol. 321, no. 19, str. 3187-3192.

MAVER, Uroš, GODEC, Aljaž, BELE, Marjan, PLANINŠEK, Odon, GABERŠČEK, Miran, SRČIČ, Stanko, JAMNIK, Janko. Novel hybrid silica xerogels for stabilization and controlled release of drug. *International journal of pharmaceutics*, ISSN 0378-5173. [Print ed.], 2007, vol. 330, no. 1/2, str. 164-174.

Univerza v Mariboru

Filozofska fakulteta

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Računalniška obdelava naravnega jezika
Course title:	Data intensive linguistics

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Vedenjska in kognitivna nevroznanost, 3. stopnja		**1. ali 2.**	**1., 3. ali 4.**
Behavioral and Cognitive Neuroscience, 3rd Degree		**1. or 2.**	**1., 3. or 4.**

Vrsta predmeta / Course type izbirni/elective

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
30	**30**				**240**	**10**

Nosilec predmeta / Lecturer: Matej Črepinšek

Jeziki / Languages:		
	Predavanja / Lectures:	slovenski / slovene
	Vaje / Tutorial:	slovenski / slovene

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

Pogoji za vključitev v delo: Osnovna znanja iz statistike in programskih jezikov.

Pogoji za opravljanje študijskih obveznosti: Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno.

Prerequisites:

Prerequisites for attending the course: Basic knowledge in statistic and programming languages.

Prerequisites for completing the course: Each of the mentioned commitments must be assessed with a passing grade.

Vsebina:

- Uvod v matematične temelje, osnove, temelji jezikoslovja, delo temelječe na dokumentih.
- Temelji besed kot zbirke, statistično sklepanje, besedno dvoumje, pridobivanje leksikalnega znanja.
- Strojna obdelava jezikov: klasifikacija jezikov, domensko specifični jeziki, sistemi na osnovi gramatik, leksikalna

Content (Syllabus outline):

- Introduction to mathematical foundations, linguistic essentials, corpus-based work.
- Words: collocations, statistical inference, word sense disambiguation, lexical acquisition.
- Computer language processing: language classification, domain specific languages, grammar based systems,

analiza, sintaksna analiza. • Sklepanje o gramatiki jezika: regularne gramatike, kontekstno neodvisne gramatike, stohastične gramatike. • Uvod v evolucijske algoritme: delitev evolucijskih algoritmov, primerjava z algoritmom vzpenjanja na hrib, simuliranega ohlajanja in , teorem NFL (No Free-Lunch). • Biološke osnove evolucijskih algoritmov. • Evolucijske strategije, evolucijsko programiranje in klasifikatorski sistemi. • Genetski algoritmi: predstavitveni problem, genetski operatorji (selekcija, križanje, mutacija), genetski algoritem s spremenljivo populacijo, genetski algoritem in problemi z omejitvami. • Genetsko programiranje: lastnosti zaprtosti in zadostnosti, gradnja dreves, osnovni in sekundarni operatorji genetskega programiranja	lexical analysis, syntax analysis. • Grammar inference: regular grammars, context-free grammars, stochastic grammars. • Introduction t. evolutionary algorithms: classification of evolutionary algorithms, comparison with hill climbing algorithm, simulated annealing and No Free-Lunch Theorem. • Biological foundations of evolutionary algorithms. • Evolutionary strategies, evolutionary programming and classifier systems. • Genetic algorithms: representation problem, genetic operators (selection, crossover, mutation), genetic algorithm with variable population size, genetic algorithm with constraints. • Genetic programming: closure and sufficiency properties, tree construction, primary and secondary operators of genetic programming.

Temeljni literatura in viri / Readings:

C. D. Manning, H. Schuetze: Foundations of Statistical Natural Language Processing, The MIT Press
M. Mernik, M. Črepinšek, V. Žumer: Evolucijski algoritmi, Univerza v Mariboru, Fakulteta za elektrotehniko, računalništvo in informatiko, Maribor, 2003.

Cilji in kompetence:	**Objectives and competences:**
Cilj tega predmeta je razumeti teoretične osnove računalniške obdelava naravnega jezika in poglobljeno razumevanje njihovega delovanja.	The objective of this course is to demonstrate understanding of theoretical basis data intensive linguistics and to obtain deep knowledge how algorithms work.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: Po zaključku tega predmeta bo študent sposoben: • razumeti teoretične osnove obdelava naravnega jezika, • primerjati posamezne pristope, • razumeti delovanje evolucijskih	Knowledge and understanding: On completion of this course the student will be able to: • understand theoretical basis of data intensive linguistics, • compare different approaches,

algoritmov, razumeti razlike med iskalnimi algoritmi, ki temeljijo na populaciji rešitev ter ostalimi iskalnimi algoritmi, • načrtovati nove izpeljanke obdelav naravnih jezikov	• understanding of evolutionary algorithms, • understand differences between population- based algorithms and other search algorithms, • designing new variants of computer based linguistics processing

Metode poučevanja in učenja:	**Learning and teaching methods:**
• predavanja, • seminarske naloge.	• lectures, • tutorial.

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Način (pisni izpit, ustno izpraševanje, naloge, projekt) pisni izpit seminar	 50 % 50 %	Type (examination, oral, coursework, project): written exam seminarwork

Reference nosilca / Lecturer's references:

ČEH, Ines, ZORMAN, Milan, ČREPINŠEK, Matej, KOSAR, Tomaž, MERNIK, Marjan, PORUBÄN, Jaroslav. Ontop : a component for acquiring information from OWL ontologies. Acta electrotech. inform., 2012, vol. 12, no. 1, str. 30-37. [COBISS.SI-ID 16120086]

ČREPINŠEK, Matej, LIU, Shih-Hsi, MERNIK, Luka. A note on teaching-learning-based optimization algorithm. Inf. sci.. [Print ed.], 2012, vol. 212, str. 79-93, doi: 10.1016/j.ins.2012.05.009.

ČEH, Ines, ČREPINŠEK, Matej, KOSAR, Tomaž, MERNIK, Marjan. Ontology driven development of domain-specific languages. Comput. Sci. Inf. Syst., May 2011, vol. 8, no. 2, str. 317-342, doi: 10.2298/CSIS101231019C.

ČREPINŠEK, Matej, MERNIK, Marjan, LIU, Shih-Hsi. Analysis of exploration and exploitation in evolutionary algorithms by ancestry trees. International journal of innovative computing and applications. [Print ed.], 2011, vol. 3, no. 1, str. 11-19.

KOSAR, Tomaž, OLIVEIRA, Nuno, MERNIK, Marjan, VARANDO PEREIRA, Maria João, ČREPINŠEK, Matej, DA CRUZ, Daniela, HENRIQUES, Pedro Rangel. Comparing generalpurpose and domain-specific languages : an empirical study. Comput. Sci. Inf. Syst., Apr. 2010, vol. 7, no. 2, str. 247-264, doi: 10.2298/CSIS1002247K.

Univerza v Mariboru

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UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Strojno učenje in aplikativna orodja
Course title:	Machine Learning and Applicable Tools

Študijski program in stopnja **Study programme and level**	**Študijska smer** **Study field**	**Letnik** **Academic year**	**Semester** **Semester**
Vedenjska in kognitivna nevroznanost, 3. stopnja		**1. ali 2.**	**1., 3. ali 4.**
Behavioral and Cognitive Neuroscience, 3rd Degree		**1. or 2.**	**1., 3. or 4.**

Vrsta predmeta / Course type	izbirni/elective
Univerzitetna koda predmeta / University course code:	

Predavanja **Lectures**	**Seminar** **Seminar**	**Vaje** **Tutorial**	**Klinične vaje** **work**	**Druge oblike študija**	**Samost. delo** **Individ. work**	**ECTS**
30	**30**				**240**	**10**

Nosilec predmeta / Lecturer:	Damjan Strnad

Jeziki / Languages:	**Predavanja / Lectures:**	slovenski / slovene
	Vaje / Tutorial:	slovenski / slovene

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisites:**
Pogoji za vključitev v delo: Osnovno znanje programiranja. **Pogoji za opravljanje študijskih obveznosti**: Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno.	**Prerequisites for attending the course:** Basic knowledge of programming. **Prerequisites for completing the course:** Each of the mentioned commitments must be assessed with a passing grade.

Vsebina:	**Content (Syllabus outline):**
• Predstavitev znanja (ontologije, kategorije in objekti, semantične mreže, logika prvega reda) • Sklepanje (sklepanje v logiki prvega reda, sklepanje z negotovim znanjem, metode odločanja) • Planiranje • Multi-agentni sistemi (definicija in tipi agentov, tehnike sodelovanja, tehnike	• Knowledge representation (ontologies, categories and objects, semantic networks, first-order logic • Inference (inference in first-order logic, uncertain reasoning, methods of decision making) • Planning • Multi-agent systems (definition and types of agents, techniques of

pogajanja, komunikacija med agenti) • Učenje (učenje z opazovanjem, odločitvena drevesa, induktivno učenje, statistične metode učenja, nevronske mreže, učenje z ojačitvijo)	cooperation, techniques of negotiation, communication) • Learning (learning by observation, decision trees, inductive learning, statistical learning methods, neural networks, reinforcement learning)

Temeljni literatura in viri / Readings:

- S. Russel, P. Norvig: Artificial Intelligence – A Modern Approcah, Prentice Hall, 2003.
- G. F. Luger: Artificial Intelligence, Addison-Wesley, Harlow, England, 2005.

Cilji in kompetence:	**Objectives and competences:**
Cilj predmeta je seznaniti študente s tehnikami predstavitve znanja, uporabe znanja za sklepanje in planiranje ter pridobivanja znanja z metodami strojnega učenja.	The objective of this course is to acquaint students with techniques of knowledge representation, use of knowledge for reasoning and planning, and acquiring knowledge through methods of machine learning.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: Po zaključku tega predmeta bo študent sposoben: • razumeti načine predstavitve znanja za strojno obdelavo, • uporabiti tako predstavljeno znanje za sklepanje in planiranje, • uporabiti metode strojnega učenja za pridobivanje znanja, • razumeti temeljne koncepte inteligentnih agentov in multiagentnih sistemov, • načrtovati preproste inteligentne agente, • zgraditi preproste sisteme verjetnostnega sklepanja	Knowledge and understanding: On completion of this course the student will be able to: • understand ways to represent knowledge for machine interpretation, • use that knowledge for reasoning and planning, • use the methods of machine learning to acquire knowledge, • understand basic concepts of intelligent agents and multiagent systems,design simple intelligent agents, • construct simple systems of probabilistic reasoning.

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

• predavanja, • laboratorijske vaje, • reševanje domačih nalog.	• lectures, • lab work, • homework assignments.

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Način (pisni izpit, ustno izpraševanje, naloge, projekt) opravljene domače naloge, opravljene laboratorijske vaje, ustni izpit.	30 % 35 % 35 %	Type (examination, oral, coursework, project): completed homeworks, completed lab work, oral examination.

Reference nosilca / Lecturer's references:

STRNAD, Damjan, NERAT, Andrej. Parallel construction of classification trees on a GPU. Concurrency and computation, ISSN 1532-0634. [Online ed.], Article first published online: 31 OCT 2015, vol. , no. , str. 1-18, doi: 10.1002/cpe.3660.

STRNAD, Damjan, NERAT, Andrej, KOHEK, Štefan. Neural network models for group behavior prediction : a case of soccer match attendance. Neural computing & applications, ISSN 0941-0643, First online: 08 September 2015, vol. , no. , str. 1-14, doi: 10.1007/s00521-015-2056-z.

STRNAD, Damjan, KOHEK, Štefan. Novel discrete differential evolution methods for virtual tree pruning optimization. Soft computing, ISSN 1432-7643. [Print ed.], Published online 19 August 2015, vol. , no. , str. 1-13, doi: 10.1007/s00500-015-1827-x.

STRNAD, Damjan. Parallel terrain visibility calculation on the graphics processing unit. Concurrency and computation, ISSN 1532-0626. [Print ed.], 2011, vol. 23, iss. 8, str. 2452-2462. http://onlinelibrary.wiley.com/doi/10.1002/cpe.1808/pdf, doi: 10.1002/cpe.1808.

STRNAD, Damjan, GUID, Nikola. Parallel alpha-beta algorithm on the GPU. V: 33rd International Conference on Information Technology Interfaces [also] ITI 2011, June 27-30, 2011, Cavtat / Dubrovnik, Croatia. LUŽAR - STIFFLER, Vesna (ur.), JAREC, Iva (ur.), BEKIĆ, Zoran (ur.). Proceedings of the ITI 2010, (ITI ... (Tisak), ISSN 1330-1012). Zagreb: University of Zagreb: University Computing Centre, cop. 2010, str. 571-576

STRNAD, Damjan, GUID, Nikola. A fuzzy-genetic decision support system for project team formation. Applied soft computing, ISSN 1568-4946, Sep. 2010, vol. 10, iss. 4, str. 1178-1187, doi: 10.1016/j.asoc.2009.08.032.

Univerza v Mariboru

Filozofska fakulteta

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Računalniška nevroznanost
Course title:	Computational neuroscience

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Vedenjska in kognitivna nevroznanost, 3. stopnja		**1. ali 2.**	**1., 3. ali 4.**
Behavioral and Cognitive Neuroscience, 3rd Degree		**1. or 2.**	**1., 3. or 4.**

Vrsta predmeta / Course type	izbirni/elective
Univerzitetna koda predmeta / University course code:	

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
30	**30**				**240**	**10**

Nosilec predmeta / Lecturer:	Tomaž Kosar

Jeziki / Languages:	**Predavanja / Lectures:**	slovenski / slovene
	Vaje / Tutorial:	slovenski / slovene

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisites:**
Pogoji za vključitev v delo: Potrebna so osnovna znanja iz matematike, še posebej dobro poznavanje naslednjih področij: verjetnosti in statistike, vektorjev in matrik. **Pogoji za opravljanje študijskih obveznosti:** Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno.	**Prerequisites for attending the course:** The backgrounds needed are good grounding in mathematics, particularly with regard to probability and statistics, vectors and matrices. **Prerequisites for completing the course:** Each of the mentioned commitments must be assessed with a passing grade.

Vsebina:	**Content (Syllabus outline):**

- Pregled področij računalniške nevroznanosti
- Nevronsko kodiranje
- Nevronsko kodiranje in dekodiranje
- Uporaba informacijske teorije za nevronsko kodiranje
- Zastopanost senzoričnih in drugih informacij v možganih z nevroni
- Modeli nevronskega kodiranja (PCA, Habbian, razpoznava objektov)
- Predstavitev znanja iz nevrobiologije - priprava podatkov in obdelava podatkov
- Nevronski modeli in Mrežni modeli
- Orodja NEURON in MatLab v računalniški nevroznanosti
- Biološke nevronske mreže:
  - Nevronske mreže: definicija, lastnosti, uporaba, model nevrona, mrežne arhitekture, proces učenja
  - Proces učenja nevronskih mrež: nadzorovano učenje, nenadzorovano učenje, druge oblike učenja, optimizacija učenja

- Overview of neural computation
- The neural code:
  - Neural encoding and decoding
  - Information theory applied to neural coding. Representation of sensory and other information in the brain by neurons
- Models of neural encoding (PCA, Hebbian learning, object recognition)
- Knowledge representation of neurobiology:
  - Neuron models
  - Network models
- Basics of NEURON and MatLab for neural computation
- Biological neural networks:
  - Neural networks: definition, properties, use, neuron model, network architectures, learning process
  - Learning neural networks: supervised learning, unsupervised learning, other learning techniques, optimisation of learning

Temeljni literatura in viri / Readings:

- P. Dayan, L. F. Abbott: Theoretical Neuroscience. MIT Press, 2001.
- P. Wallisch, M. Lusignan, M. Benayoun, T. I. Baker: Matlab for Neuroscientists: An Introduction to Scientific Computing in Matlab, Academic Press, 2008.
- S. Haykin: Neural Networks. A Comprehensive Foundation, Macmillan College Publ. Company, New York, 1994.

Cilji in kompetence:

Cilj predmeta je spoznati računsko ozadje, ki jih izvajajo živčni sistemi. Študentje se naučijo vključevati podatke iz nevrobiologije, jih simulirati in formulirati teorije o možganih.

Objectives and competences:

The objective of this course is to study the computations carried out by the nervous system. Students incorporate data from neurobiology, simulate and formulate theories about the brain.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: Po zaključku tega predmeta bo študent sposoben: • Razumeti temeljne koncepte iz nevroznanosti, • Razumeti koncepte in metodologije pri kognitivnem modeliranju, • Razumeti temeljne koncepte nevronskih mrež, • Uporabljati specialne sisteme na področju nevroznanosti.	Knowledge and understanding: On completion of this course the student will be able to: • Understand basic concepts from neuroscience, • Understand basic concepts and methodology underlying cognitive modelling, • Understand basic concepts of neural networks, • Use special software tools in field of neuroscience.

Metode poučevanja in učenja:	**Learning and teaching methods:**
• predavanja, • raziskovalni projekt, • laboratorijske vaje, • reševanje domačih nalog	• lectures, • research project, • lab work, • homework assignments.

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Način (pisni izpit, ustno izpraševanje, naloge, projekt)		Type (examination, oral, coursework, project):
pisni izpit,	15%	examination,
ustno izpraševanje,	35%	oral,
naloge,	15%	coursework,
projekt	35%	project

Reference nosilca / Lecturer's references:

CHALLENGER, Moharram, MERNIK, Marjan, KARDAS, Geylani, KOSAR, Tomaž. Declarative specifications for the development of multi-agent systems. Computer standards & interfaces, ISSN 0920-5489. [Print ed.], Available online 4 September 2015, vol. , iss. , str. 1-43, doi: 10.1016/j.csi.2015.08.012.

KOS, Tomaž, MERNIK, Marjan, KOSAR, Tomaž. Test automation of a measurement system using a domain-specific modelling language. The Journal of Systems and Software, ISSN 0164-1212. [Print ed.], Available online 10 September 2015, vol. , iss. , str. 1-38, doi: 10.1016/j.jss.2015.09.002.

KOSAR, Tomaž, MERNIK, Marjan, GRAY, Jeffrey G., KOS, Tomaž. Debugging measurement systems using a domain-specific modeling language. Computers in industry, ISSN 0166-3615. [Print ed.], 2014, vol. 65, iss. 4, str. 622-635, doi: 10.1016/j.compind.2014.01.013.

CHALLENGER, Moharram, DEMIRKOL, Sebla, GETIR, Sinem, MERNIK, Marjan, KARDAS, Geylani, KOSAR, Tomaž. On the use of a domain-specific modeling language in the development of multiagent systems.

Engineering applications of artificial intelligence, ISSN 0952-1976. [Print ed.], Feb. 2014, vol. 28, str. 111-141, doi: 10.1016/j.engappai.2013.11.012.

DEMIRKOL, Sebla, CHALLENGER, Moharram, GETIR, Sinem, KOSAR, Tomaž, KARDAS, Geylani, MERNIK, Marjan. A DSL for the development of software agents working within a semantic web environment. Computer Science and Information Systems, ISSN 1820-0214, 2013, vol. 10, iss. 4, str. 1525-1556, doi: 10.2298/CSIS121105044D.

KOSAR, Tomaž, MERNIK, Marjan, CARVER, Jeffrey C. Program comprehension of domain-specific and general-purpose languages : comparison using a family of experiments. Empirical software engineering, ISSN 1382-3256, 2012, vol. 17, no. 3, str. 276-304, doi: 10.1007/s10664-011-9172-x.

Univerza v Mariboru

Filozofska fakulteta

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Filozofija duha in nevroznanost
Course title:	Philosophy of mind and Neuroscience

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Vedenjska in kognitivna nevroznanost, 3. stopnja		**1. ali 2.**	**1., 3. ali 4.**
Behavioural and Cognitive Neuroscience, 3rd degree		**1. or 2.**	**1., 3. or 4.**

Vrsta predmeta / Course type	izbirni/elective
Univerzitetna koda predmeta / University course code:	

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
30	**30**				**240**	**10**

Nosilec predmeta / Lecturer:	Janez Bregant

Jeziki / Languages:	**Predavanja / Lectures:**	slovenski / slovene
	Vaje / Tutorial:	slovenski / slovene

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisites:**
Pogoji za vključitev v delo: Pogojev ni. **Pogoji za opravljanje študijskih obveznosti**: Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno.	**Prerequisites for attending the course:** None. **Prerequisites for completing the course:** Each of the mentioned commitments must be assessed with a passing grade.

Vsebina:	**Content (Syllabus outline):**
• Metafizika duha: problem duha in telesa (kakšna je relacija med mentalnimi in fizičnimi stanji). • Epistemologija duha: ali imajo tudi drugi duha, ali je njihov duh podoben našemu, ali imamo sposobnost notranjega opazovanja naših mentalnih pojavov, kaj pomeni imeti privilegiran dostop do vsebine mentalnih pojavov. • Zavest: narava zavesti, zveza med zavestjo in svobodno voljo, vrste zavesti. • Filozofija duha in umetna inteligenca:	• Metaphysics of mind: the mind-body problem (what is a relation between mental and physical states), • Epistemology of mind: do others also have minds, are these minds similar to ours, do we have some special capacity of internal observation of our mental states, what is to have the privileged access to contents of our minds. • Consciousness: the nature of consciousness, a relation between consciousness and free will, concepts of consciousness.

reprezentacije, intencionalnost, komputacija. • Umetna inteligenca: začetki, cilji, pristopi, problemi. • Filozofska vprašanja znotraj umetne inteligence: ali stroji lahko mislijo, ali se stroji zavedajo, ali stroji lahko čutijo, ali stroji ravnajo svobodno. • Nevroznanost: teorija nevronov: zgodovinski pregled, celična zgradba živčnega sistema, način delovanja nevronov, nevronske mreže. • Filozofija duha: zgodovina, dualizem (substanc in lastnosti), redukcija, funkcionalizem. • Filozofija nevroznanosti: kaj nevroznanost pojasnjuje, kaj je nevroznanstvena pojasnitev, s katerimi metodami nevroznanstveniki pridejo do znanja in kako to, da so njihova orodja zanesljiva in učinkovita, • Nevrofilozofija: uporaba nevroznanstvenih dognanj pri reševanju tradicionalnih problemov filozofije duha: kje so predstave, kakšno naravo imajo čustva, kje je locirana zavest, kakšno naravo ima osebno kvalitativno izkustvo (takšnost).	• Philosophy of mind and artificial intelligence: representation, intentionality, computation. • Artificial intelligence: beginnings, aims, approaches, problems. • Philosophical questions within artificial intelligence: can machines think, are computers conscious, can machines sense, are computers free in acting. • Neurosience: theory of neurons: historical overview, cellular structure of the nervous system, how neurons work, neural networks. • Philosophy of mind: history, (substance and property) dualism, reduction, functionalism. • Philosophy of neuroscience: what does neuroscience explain, what is a neuroscientific explanation, what are the methods used by neuroscientists in order to gain knowledge and why are their instruments reliable and effective. • Neurophilosophy: application of neuroscientific results to solve traditional problems in philosophy of mind: where are representations, what is the nature of emotions, what is a location of consciousness, what is the nature of subjective qualitative experiences (qualia).

Temeljni literatura in viri / Readings:

Bechtel, W., Mandik, P., Mundale, J., Stufflebeam, R. (ur.) (2001). *Philosophy and the Neurosciences*. Oxford: Blackwell Publishers.
Bechtel, W., Abrahamsen, A. (2002). *Connectionism and the Mind*. Oxford: Blackwell Publisher.
Bermúdez, J. L. (2005). *Philosophy of Psychology: A Contemporary Intorudction*. London: Routledge.
Bermudez, J. J. (2010). *Cognitive Science*. Cambridge: Cambridge University Press.
Bickle, J. (2003). *Philosophy and Neuroscience: A Ruthlessly Reductive Account*. Dordrecht: Kluwer Academic Publishers.
Bregant, J. (2004). *Misel kot vzrok*. Pedagoška fakulteta: Maribor.
Churchland, P. M. (1989). *Neurophilosophy*. Cambridge: The MIT Press.
Churchland, P. M. (2002). *Brain-Wise: Studies in Neurophilosophy*. Cambridge: The MIT Press.
Copeland, J. (1993). *Artificial Intelligence: A Philosophical Introduction*. Oxford: Basil Blackwell.
Dennet, D. C. (1993). *Consciousness Explained*. London: Penguin.
Hofstadter, D. R., Dennett, D. C. (ur.) (1990). *Oko duha*. Ljubljana: Mladinska knjiga.
Kim, J. (1996): *Philosophy of Mind*. Boulder: Westview Press.

Markič, O., Bregant, J. (ur.) (2007). *Narava mentalnih* pojavov. Maribor: Aristej.
Miščević, N., Markič, O. (1998). *Fizično in Psihično*. Šentilj: Aristej.
Tye, M. (1997). *Ten Problems of Consciousness*. Cambridge: The MIT Press.

Cilji in kompetence:

Cilj tega predmeta je razvijati filozofske kompetence in argumentativne sposobnosti s pomočjo razumevanja problemov filozofije duha ter razpravljanja o njihovih rešitvah, ki temelji na prepoznavanju nujnosti uporabe rezultatov raziskav v nevroznanosti ter na kritičnem ocenjevanju predlaganih odgovorov in iskanju samostojnih ter izvirnih rešitev.

Objectives and competences:

The objective of this course is to evolve philosophical competence and argumentative capacities by understanding problems of mind and body and by discussing their solutions based on a recognition of necessity to employ findings in neurosciences and on a critical evaluation of proposed answers as well as on a search for autonomous and original solutions.

Predvideni študijski rezultati:

Znanje in razumevanje:

Po zaključku tega predmeta bo študent sposoben:

- Znanje in razumevanje: prepoznati filozofska vprašanja v različnih vrstah razprav, jasno in z občutkom predstaviti različno stara besedila različnih tradicij, natančno izraziti misli pri analizi in oblikovanju zapletenih ter spornih problemov.
- Uporaba in analiza: analizirati in razvijati zdrave argumente ter prepoznati v njih logične zmote, metodološke napake, metaforične trditve ali nepotrjene ljudske modrosti, izmišljati ali odkrivati primere v podporo ali zoper neko stališče in razlikovati med tistimi, ki so relevantni, in tistimi, ki niso.
- Sinteza in vrednotenje: kritično preučevati in samostojno oblikovati najboljše argumente za različna stališča ter iskati njihove najšibkejše korake, strpno in odprto vrednotiti poglede in argumente drugih, konceptualizirati lastno filozofsko dejavnost.

Intended learning outcomes:

Knowledge and understanding:

On completion of this course the student will be able to:

- Knowledge and understanding: identify underlying issues in all kinds of debates, sensitively interpret texts drawn from a variety of ages and traditions, express and formulate complex and controversial problems precisely.
- Use and analysis: analyse and construct sound arguments and recognise logical fallacies, methodological errors, rhetorical devices or unexamined conventional wisdom, invent or discover cases to support or challenge a position, and distinguish those that are relevant from those that are not.
- Synthesis and evaluation: critically examine and independently formulate the best arguments for variety of positions and look for their weakest parts, evaluate views and arguments of others tolerantly and openly, conceptualize her own philosophical activity.

Metode poučevanja in učenja:

Learning and teaching methods:

• Predavanja • Seminar z razpravo	• Lectures • A seminar with a discussion

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
• Ustni izpit • Opravljen seminar.	**50%** **50%**	• Oral examination • A completed seminar

Reference nosilca / Lecturer's references:

BREGANT, Janez. Physicalism, or something near enough : good enough to be a global theory?. *Croatian journal of philosophy*, ISSN 1333-1108, 2009, vol. 9, no. 26, str. 219-232. [COBISS.SI-ID 17104904]

BREGANT, Janez, STOŽER, Andraž, CERKVENIK, Marko. Molecular reduction : reality or fiction?. *Synthese (Dordrecht)*, 2010, 172, str. 437-450, doi: 10.1007/s11229-008-9401-z. [COBISS.SI-ID 16399112]

BREGANT, Janez. Ali lahko stroj misli?. *Analiza (Ljubl.)*, 2010, letn. 14, št. 4, str. 55-72. [COBISS.SI-ID 18174728]

BREGANT, Janez. Funkcionalizem, računalniki in "kitajska soba". *Analiza*, ISSN 1408-2969, 2013, letn. 17, št. 3, str. 67-95, ilustr. [COBISS.SI-ID 20307976]

ABERŠEK, Boris, BORSTNER, Bojan, BREGANT, Janez. Virtual teacher : cognitive approach to e-learning material. Newcastle upon Tyne: Cambridge Scholars Publishing, 2014. XI, 289 str., ilustr. ISBN 1-4438-6524-9. ISBN 978-1-4438-6524-1. [COBISS.SI-ID 20951304]

Univerza v Mariboru

Filozofska fakulteta

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Izbrana poglavja iz matematike
Course title:	Selected matematical topics

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Vedenjska in kognitivna nevroznanost, 3. stopnja		**1. ali 2.**	**1., 3. ali 4.**
Behavioral and Cognitive Neuroscience, 3rd Degree		**1. or 2.**	**1., 3. or 4.**

Vrsta predmeta / Course type	izbirni/elective
Univerzitetna koda predmeta / University course code:	

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
30	**30**				**240**	**10**

Nosilec predmeta / Lecturer:	Joso Vukman

Jeziki / Languages:	**Predavanja / Lectures:**	slovenski / slovene
	Vaje / Tutorial:	slovenski / slovene

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisites:**
Pogoji za vključitev v delo: Jih ni. **Pogoji za opravljanje študijskih obveznosti**: Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno.	**Prerequisites for attending the course:** None. **Prerequisites for completing the course:** Each of the mentioned commitments must be assessed with a passing grade.

Vsebina:	**Content (Syllabus outline):**
• Osnove matematične logike • Osnove realne analize: realna števila, zaporedja, vrste, analiza funkcije ene spremenljivke (odvod, integral) • Osnove linearne algebre: vektorji, matrični račun, sistemi linearnih enačb, lastne vrednosti • Osnove Fourierjeve analize	• Basics of mathematical logic • Basics of analysis • Basics of linear algebra • Basics of Fourier's transformation

Temeljni literatura in viri / Readings:

- Vidav, Višja matematika I, DMFA
- Vidav, Višja matematika II, DMFA
- I Vidav, Višja matematika III, DMFA
- J. Grasselli, Linearna algebra, DMFA
- Druga relevantna tuja literatura

Cilji in kompetence:	**Objectives and competences:**
Namen predmeta je študente pregledno seznaniti z nekaterimi osnovnimi matematičnimi znanji, ki jih potrebujejo pri svojem delu. Vpeljava metod je motivirana s primeri iz psihologije in statistike. Študenti pridobijo najpotrebnejše znanje iz matematične analize in linearne algebre	The aim is to inform students with basic mathematical knowledge. Students become familiar with basic principles in algebra analysis and statistics.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: • poznavanje in razumevanje matematične logike, • poznavanje in razumevanje osnovnih konceptov obravnave realnih funkcij, • poznavanje in razumevanje osnovnih konceptov linearne algebre, • poznavanje in razumevanje osnovnih konceptov iz Fourirjeve analize	Knowledge and Understanding: • Understanding of mathematical logic • Understanding of basic concepts of functions Understanding of basic concepts of linear algebra • Understanding of basic concepts of Fourier's transformation

Metode poučevanja in učenja:	**Learning and teaching methods:**
• Predavanja • Seminarske vaje	• Lectures • Theoretical excersises

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Način (pisni izpit, ustno izpraševanje, naloge, projekt) • Pisni izpit • Ustni izpit	 50 50	Type (examination, oral, coursework, project): • Written exam • Oral exam

Reference nosilca / Lecturer's references:

KOSI-ULBL, Irena, VUKMAN, Joso. A note on (m,n)-Jordan derivations of rings and Banach algebras. Bulletin of the Australian Mathematical Society, ISSN 0004-9727, 2015, 7 str., doi: 10.1017/S0004972715001203.

FOŠNER, Maja, ŠIROVNIK, Nejc, VUKMAN, Joso. A result related to Herstein theorem. Bulletin of the Malaysian mathematical sciences society, ISSN 2180-4206, 2015, [15] str.

http://link.springer.com/article/10.1007/s40840-015-0196-z, doi: 10.1007/s40840-015-0196-z.

ŠIROVNIK, Nejc, VUKMAN, Joso. On derivations of operator algebras with involution. Demonstratio mathematica, ISSN 0420-1213, 2014, vol. 47, no. 4, str. 784-790. http://demmath.mini.pw.edu.pl/archive/dm47_4/2.pdf.

ŠIROVNIK, Nejc, VUKMAN, Joso. On certain functional equation related to a class of generalized inner derivations. Operators and matrices, ISSN 1846-3886, 2014, vol. 8, no. 3, str. 651-658. http://oam.ele-math.com/08-35/On-certain-functional-equation-related-to-a-class-of-generalized-inner-derivations.

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VUKMAN, Joso. Some remarks on derivations in semiprime rings and standard operator algebras. Glasnik matematički. Serija 3, ISSN 0017-095X, 2011, vol. 46, no. 1, str. 43-48. http://dx.doi.org/10.3336/gm.46.1.07.

Univerza v Mariboru

Filozofska fakulteta

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Veščine psihološkega znanstvenega raziskovanja
Course title:	Psychological research skills

Študijski program in stopnja **Study programme and level**	**Študijska smer** **Study field**	**Letnik** **Academic year**	**Semester** **Semester**
Vedenjska in kognitivna nevroznanost, 3. stopnja		**1. ali 2.**	**1., 3. ali 4.**
Behavioral and Cognitive Neuroscience, 3rd Degree		**1. or 2.**	**1., 3. or 4.**

Vrsta predmeta / Course type	izbirni/elective
Univerzitetna koda predmeta / University course code:	

Predavanja **Lectures**	**Seminar** **Seminar**	**Vaje** **Tutorial**	**Klinične vaje** **work**	**Druge oblike študija**	**Samost. delo** **Individ. work**	**ECTS**
30	**30**				**240**	**10**

Nosilec predmeta / Lecturer:	Sara Tement, Bojan Musil, Karin Bakračevič Vukman

Jeziki / Languages:	**Predavanja / Lectures:**	slovenski/ slovene
	Vaje / Tutorial:	slovenski / slovene

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisites:**
Pogoji za vključitev v delo: Pogojev ni. **Pogoji za opravljanje študijskih obveznosti**: Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno.	**Prerequisites for attending the course:** None. **Prerequisites for completing the course:** Each of the mentioned commitments must be assessed with a passing grade.

Vsebina:	**Content (Syllabus outline):**
22. Znanstveno pisanje: Iskanje in dokumentacija literature, struktura znanstvenih člankov, načela pisanja teoretičnih in empiričnih člankov 23. Objavljanje znanstvenih publikacij: Načelo dvojne slepe recenzije, zahteve	11. Academic writing: Literature search and documentation, structure of research articles, principles of writing theoretical and empirical articles 12. Publishing research: Peer-review process, demands of academic journals

znanstvenih revij 24. Ustno predstavljanje znanstvenih izsledkov 25. Druge vsebine povezane z izgradnjo raziskovalne kariere: Pisanje projektnih prijav, učinkovito sodelovanje s študenti, poučevanje na visokošolski instituciji	13. Conference talks & poster presentations 14. Other topics related to building a career in research: Project proposals, collaboration with students, university teaching

Temeljni literatura in viri / Readings:

American Psychological Association. (Ed.) (2010). *Publication manual of the American Psychological Association (6th ed.).* Washington, DC: American Psychological Association.
Belcher, L. W. (2009). *Writing your journal article in 12 weeks: A guide to academic publishing success.* Thousand Oaks, CA: Sage.
Evans, J. St. B. T. (2015). *How to be a researcher: A strategic guide to academic success.* Hove, UK: Psychology Press.
Leong, F. T. L. & Austin, J. T. (2006). *The psychology research handbook: A guide for graduate students and research assistants (2nd ed.*). Thousand Oaks, CA: Sage Publications.
Sternberg, R. J. (2003). *The psychologist's companion: A guide to scientific writing for students and researchers (4th ed.).* New York: Cambridge University Press.

Cilji in kompetence:	**Objectives and competences:**
Cilj predmeta je študente seznaniti s pisanjem znanstvenih člankov in drugih znanstvenih publikacij. Posebej bodo spoznali proces zbiranja in dokumentiranja literature in pisanja vsakega poglavja v psiholoških znanstvenih člankih. Pri tem bo poudarek tako na teoretičnih kot na empiričnih člankih. Študenti bodo pridobili tudi vpogled v proces objavljanja znanstvenih publikacij. Pri predmetu bodo dobili priložnost za krepitev veščin predstavljanja znanstvenih izsledkov, seznanjeni pa bodo tudi z nekaterimi načeli tovrstnega javnega nastopanja. Pričujoč predmet bo študentom ponudil tudi usmeritve pri izgradnji raziskovalne kariere.	The aim of the course is to introduce the students to academic writing. More precisely, they will be acquainted with the literature search process and documentation of research as well as the process of writing each part of a psychological article. The students will obtain also insights into the publication process. During the course they will get the opportunity to strengthen their skills of presenting research findings and will introduced to some of the principle of this special form of public speaking. The present course will also offer directions to the students on how to establish a research career.

Predvideni študijski rezultati:	**Intended learning outcomes:**

Znanje in razumevanje: Študenti poznajo posamezne elemente znanstvenega pisanja (npr. priprava naslov, pisanje povzetka, uvoda, metode, rezultatov, interpretacije) in pridobljeno znanje znajo uporabiti pri samostojnem znanstvenem pisanju. Dodatno študenti poznajo procesa znanstvenega objavljanja in so zmožni kritične presoje svojih in tujih znanstvenih publikacij. Študenti obvladajo veščine predstavljanja znanstvenih izsledkov in zmorejo presoditi, kakšna oblika predstavitve je najbolj primerna za njihove rezultate.	Knowledge and understanding: Students are familiar with specific elements of scientific writing (e. g., preparing the title, writing the abstract, the introduction , the methods, results, and interpretation sections) and able to use the obtained knowledge for independent scientific writing. Furthermore, the students are familiar with the process of scientific publication and are able to critically evaluate their own and other's scientific publications. Students master the skills of presenting scientific evidence and are able to evaluate what form of presentation is best suited for their results.

Metode poučevanja in učenja:	**Learning and teaching methods:**
Ustne predstavitve E-učenje Problemsko zastavljene naloge	Oral presentations E-learning Problem-based learning exercises

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Ustna predstavitev vsebin	**50%**	Oral presentation
Pisne naloge	**50%**	Coursework

Reference nosilca / Lecturer's references:

SEDLAR, Nataša, ŠPRAH, Lilijana, TEMENT, Sara, SOČAN, Gregor. Internal structure of an alternative measure of burnout : study on the Slovenian adaptation of the Oldenburg Burnout Inventory (OLBI). Burnout research, ISSN 2213-0586, Available online 20 February 2015, str. 1-7. http://www.sciencedirect.com/science/article/pii/S2213058615000029#, doi: 10.1016/j.burn.2015.02.001. [COBISS.SI-ID 21193736]

TEMENT, Sara, KORUNKA, Christian. The moderating impact of types of caregiving on job demands, resources, and their relation to work-to-family conflict and enrichment. Journal of family issues, ISSN 0192-513X, 2015, 36, no. 1, str. 31-55, doi: 10.1177/0192513X13483971. [COBISS.SI-ID 19825416]

KOŠIR, Katja, TEMENT, Sara, LICARDO, Marta, HABE, Katarina. Two sides of the same coin? : the role of rumination and reflection in elementary school teachers' classroom stress and burnout. Teaching and teacher education, ISSN 0742-051X. [Print ed.], 2015, vol. 47, str. 131-141, doi: 10.1016/j.tate.2015.01.006. [COBISS.SI-ID 21087240]

TEMENT, Sara. The role of personal and key resources in the family-to-work enrichment process. Scandinavian journal of psychology, ISSN 0036-5564, Oct. 2014, vol. 55, iss. 5, str. 489-496, ilustr., doi: 10.1111/sjop.12146. [COBISS.SI-ID 20723720]

TEMENT, Sara, KORUNKA, Christian. Does trait affectivity predict work-to-family conflict and enrichment beyond job characteristics?. The Journal of psychology, ISSN 0022-3980, 2013, vol. 147, no. 2, str. 197-216, tabele, doi: http://dx.doi.org/10.1080/00223980.2012.683053. [COBISS.SI-ID 19618056]

RANTANEN, Johanna, KINNUNEN, Ulla, MAUNO, Saija, TEMENT, Sara. Patterns of conflict and enrichment in work-family balance : a three-dimensional typology. Work and stress, ISSN 0267-8373, 2013, vol. 27, no. 2, str. 141-163, doi: 10.1080/02678373.2013.791074. [COBISS.SI-ID 19868168]

MUSIL, Bojan, LAVRIČ, Miran. Values, sustainable social functioning and visions of the future. V: LAVRIČ, Miran (ur.), et al. *Youth 2010 : the social profile of young people in Slovenia*. 1st ed. Ljubljana: Ministry of Education and Sports, Office for Youth; Maribor: Aristej, 2011, str. 419-448, ilustr. [COBISS.SI-ID 18696456]

MUSIL, Bojan. Basic shifts in value orientations in post-Yugoslav region : convergence or divergence?. V: FLERE, Sergej (ur.), et al. *20 years later : problems and prospects of countries of former Yugoslavia*. Maribor: Center for the Study of Post-Yugoslav Societes, Faculty of Arts, 2013, str. 201-221, ilustr. [COBISS.SI-ID 19740424]

PERRY, John L., MCKAY, Michael T., WORRELL, Frank C., ŽIVKOVIČ, Urška, MELLO, Zena R., MUSIL, Bojan. Measuring time perspective in adolescents : can you get the right answer by asking the wrong questions?. *Personality and Individual Differences*, ISSN 0191-8869. [Print ed.], May 2015, vol. 78, str. 53-57, doi: 10.1016/j.paid.2015.01.015. [COBISS.SI-ID 21149192]

MUSIL, Bojan, TEMENT, Sara, BAKRAČEVIČ VUKMAN, Karin, ŠOŠTARIČ, Ajda. Aggression in school and family contexts among youngsters with special needs : qualitative and quantitative evidence from the TranSpace project. *Children and youth services review*, ISSN 0190-7409, September 2014, vol. 44, str. 46-55, ilustr., doi: 10.1016/j.childyouth.2014.06.005. [COBISS.SI-ID 20723208]