

UČNI NAČRT PREDMETA / COURSE SYLLABUS**Predmet:** Kreativnost in kritično razmišljanje**Course title:** Creativity and Critical Thinking

Študijski program in stopnja	Študijska smer	Letnik	Semester
Study programme and level	Study field	Academic year	Semester

Podatkovne znanosti, magistrski študijski program druge stopnje	-	drugi	četrty
The second cycle masters study programme Data Sciences	-	second	fourth

Vrsta predmeta / Course type

Obvezni/Compulsory

Univerzitetna koda predmeta / University course code:

2-PZ-MAG-KKR-2020-06-30

Predavanja	Seminar	Vaje	Klinične vaje	Druge oblike študija	Samost. delo	ECTS
Lectures	Seminar	Tutorial	work	študija	Individ. work	
10	-	15	-	-	65	3

Nosilec predmeta / Lecturer: doc. dr. Robert Kopal**Jeziki / Predavanja /** Slovenščina/English
Languages: Lectures:**Vaje / Tutorial:** Slovenščina/English**Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:****Prerequisites:**

Ni posebnih pogojev za vključitev v delo.

Pogoj za pristop k pisnemu izpitu je pravočasna oddaja in pozitivna ocena domačih nalog.

There are no special prerequisites for the inclusion in work.

Student has to submit homework assignments within the due time. If the assignments are positively graded, he/she is allowed to write the exam.

Vsebina:

Content (Syllabus outline):

Kreativnost - kaj in zakaj?

- Kognitivne omejitve
- Kreativne blokade
- Inovacijski motor Tine Seelig
- Kreativnost v digitalni dobi

Tehnike kreativnega mišljenja

- Tehnike uokvirjanja
- Tehnike povezovanja in združevanja
- Tehnike preverjanja predpostavk
- Analogije
- Simbolni jezik

Hevristika in pristranskost oz. predsodki

- Kulturni predsodki
- Organizacijski predsodki
- Kognitivni predsodki

Logika in sklepanje

- Argument
- Vrste sklepanj
- Pravila dedukcije

Zmote oz. napake

- Struktura
- Ustreznost
- Sprejemljivost
- Zadostnost
- Učinkovitost zavrnitve

Metode kritičnega mišljenja

- Okvir Paula-Elderja za analizo in kritiko

Creativity - what and why?

- Cognitive limitations
- Creativity blocks
- Tina Seelig's Innovation Engine
- Creativity in the digital age

Creative thinking techniques

- Framing Techniques
- Connect and Combine Techniques
- Assumptions Testing Techniques
- Analogies
- Language of Symbols

Heuristics and biases

- Cultural Biases
- Organizational Biases
- Cognitive Biases

Logic and reasoning

- Argument
- Types of Reasoning
- Rules of Deduction

Fallacies

- Structure
- Relevance
- Acceptability
- Sufficiency
- Effectiveness of Rebuttal

Critical thinking methods

- Paul-Elder framework for analysis and critique.

Temeljni literatura in viri / Readings:

Michalko, M. (2006): *Thinkertoys: A Handbook of Creative Thinking Techniques*, 2nd edition, Ten Speed Press.

Paul, R.; Elder, L. (2014): *Critical Thinking: Tools for Taking Charge of Your Professional and Personal Life*, 2nd edition. Pearson Education.

Damer, E. T. (2008): *Attacking Faulty Reasoning: A Practical Guide to Fallacy-Free Argument*. 7th edition. Boston, MA: Wadsworth, Cengage Learning.

Cottrell, S. (2017): *Critical Thinking Skills: Effective Analysis, Argument and Reflection*. 3rd edition. London : Palgrave.

Kopal, R. *Prosojnice iz predavanj pri predmetu Kreativnost in kritično razmišljanje*, Moodle, FIS.

Cilji in kompetence:

Objectives and competences:

Splošne kompetence

- Sposobnost skrbeti za kakovost strokovnega dela skozi avtonomnost, samoiniciativnost, (samo)kritičnost, (samo)refleksivnost in (samo)evalviranje
- Uporaba ustreznih metodoloških pristopov za izvajanje, koordiniranje in organiziranje raziskav
- Poglobljeno razumevanje in kritično razmišljanje o omejitvah oz. kvaliteti podatkov in njihovi etični uporabi

Predmetno specifične kompetence

- Prepoznavanje ključnih konceptov, pomembnih za razvoj kreativnosti in uvajanje inovativnih rešitev na različnih področjih življenja in poslovanja.
- Opredelitev problema kognitivnih omejitev in kreativnih blokad pri reševanju kompleksnih poslovnih problemov in sprejemanju poslovnih odločitev.
- Uporaba kreativnih analitičnih tehnik, ki so usmerjene k dvigu ravni kreativnosti in inovativnosti v poslovnem okolju.
- Uporaba osnovnih konceptov kritičnega mišljenja in logičnega sklepanja za zmanjšanje vpliva iracionalnega in subjektivnega sklepanja, predsodkov, zmot in hevrstike pri oblikovanju sklepov in pri poslovnih odločitvah.
- Kritično vrednotenje argumentov, predpostavk, abstraktnih konceptov in podatkov pri poslovnih problemih in v vsakdanjem življenju.
- Oblikovanje veljavnih in trdnih sklepov ter gradnja »neprebojnih« argumentov.

General Competences

- The ability to manage quality of professional work through autonomy, initiative, as well as (self-)criticism, (self-)reflection and (self-)evaluation
- Utilization of adequate methodological approaches to conduct, coordination and organization of research
- In-depth understanding and critical thinking about limitations of data quality and their ethical usage

Subject-specific Competences

- Identifying key concepts important for the development of creativity and implementation of innovative solutions in various areas of life and business.
- Defining the problem of cognitive limitations and creativity blocks in resolving complex business problems and making business decisions.
- Applying creative analytical techniques aimed at raising the level of creativity and innovation in business environment.
- Applying basic concepts of critical thinking and logical reasoning for reducing the impact of irrational and subjective reasoning, biases, fallacies, and heuristics in making inferences and business decisions.
- Critically evaluating arguments, assumptions, abstract concepts and data in business problems and everyday life.
- Making valid and sound inferences, and building bulletproof arguments.

Predvideni študijski rezultati:

Intended learning outcomes:

Znanje in razumevanje:*Študent/študentka:*

- Kritično oceni razloge za uporabo tehnik kreativnega mišljenja - na splošno in za reševanje poslovnih problemov
- Priporoči načine reševanja poslovnih problemov z uporabo nestrukturiranih tehnik kreativnosti
- Spozna kako heuristika in predsodki ovirajo logiko in objektivnost
- Primerja različne vrste logičnega sklepanja in oceni prednosti sklepanja
- Oceni metodološki okvir za analizo in kritiko

Knowledge and understanding:*The student:*

- Critically assesses reasons for applying creative thinking techniques, in general and for solving business problems
- Recommend ways of solving business problems using unstructured creativity techniques
- Grasp how heuristics and biases hinder logic and objectivity
- Compare various types of logical reasoning and assess the strengths of inference
- Evaluate the methodological framework for analysis and critique

Metode poučevanja in učenja:

Predavanja, predstavitve, razprave, sodelovanje, praktično delo.

Learning and teaching methods:

Lectures, demonstrations, discussions, collaboration, practice by doing;

Delež (v %) /

Načini ocenjevanja:

Weight (in %) **Assessment:**

Način (pisni izpit, ustno izpraševanje, naloge, projekt)		Type (examination, oral, coursework, project):
Pisni izpit	80 %	Written exam
Domače naloge	20 %	homeworks

Reference nosilca / Lecturer's references:

Klepac, G., Kopal, R., Mrcic, L. (2017) A New Paradigm in Fraud Detection Modeling Using Predictive Models, Fuzzy Expert Systems, Social Network Analysis, and Unstructured Data, Computational Intelligence Applications in Business Intelligence and Big Data Analytics, 141-179.

Klepac, G., Kopal, R., Mrcic, L. (2017) Social network metrics integration into fuzzy expert system and bayesian network for better data science solution performance, Hybrid Intelligence for Social Networks, 25-45.

Kopal, R., Korkut, D. (2018) Kreativnost 4.0: evolucija i revolucija, Zagreb, Effectus Studij financije i pravo – Visoko učilište

Klepac, G., Kopal, R., Mrcic, L. (2019) Early Warning System Framework Proposal, Based on Big Data Environment, International Journal of Artificial Intelligence and Machine Learning 9(1), 35-66.