UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	USTVARJALNE TEHNIČNE DELAVNICE
Course title:	Creative Technical Workshops

Vrsta predmeta / Course type	D - Splošni izbirni predmet
Univerzitetna koda predmeta / University course code:	/

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
30	0	0	30	0	60	4

Nosilec predmeta / Lecturer:

izr. prof. dr. Stanislav Avsec

Jeziki / Languages:	**Predavanja / Lectures:**	slovenščina, angleščina
	Vaje / Tutorial:	slovenščina, angleščina

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

1. Aktivna udeležba pri vajah in delavnicah.
2. K zaključnemu izpitu lahko pristopi, kdor je uspešno izdelal, ovrednotil in predstavil projekt z zaključnim poročilom iz kliničnih vaj ter je vpisan v letnik študija.

Prerequisits:

1. Active participation in practical/laboratory classes and workshops.
2. The final examination can be approached by anyone, who has successfully made, evaluated, and presented the project and submitted the final laboratory classes report and is registered in the year of study.

Vsebina:

1. Pomembnost ustvarjalnosti v tehniki.
2. Ustvarjalnost in izumiteljstvo.
3. Ustvarjalno razmišljanje v tehniki in tehnologiji.
4. Ustvarjalno delo in prilagoditve za vrtec/šolo.
5. Tehnike, metode in strategije ustvarjalnega razmišljanja za tehniko in tehnologijo.
6. S tehnologijami podprto iskanje in reševanje tehniških in tehnoloških problemov.
7. Oblikovalsko razmišljanje v vrtcu/šoli.
8. Vrednotenje in odločanje za izbiro.

Content (Syllabus outline):

1. Importance of creativity in design and technology.
2. Creativity and inventiveness.
3. Creative thinking in design and technology.
4. Creative work and adaptations for kindergarten/school.
5. Techniques, methods and strategies of creative thinking in design and technology.
6. Technology-based problem-finding and –solving in design and technology.
7. Design thinking in education.
8. Evaluation and decision making.

Temeljni literatura in viri / Readings:

1. Cropley, D. H. (2015). Creativity in engineering: Novel solutions to complex problems. San Diego, CA: Academic Press.
2. Taura, T. (2016). Creative design engineering - Introduction to an Interdisciplinary Approach. London, UK: Elsevier.

3. Wilson, A. (2009). Creativity in Primary Education. Exeter, UK: Learning Matters Ltd.
4. Fautley, M. and Savage, J. (2007). Creativity in Secondary Education. Exeter, UK: Learning Matters Ltd.
5. Gregerson, M.B., Snyder, H.T. and Kaufman, J.C. (2013). Teaching Creatively and Teaching Creativity. New York, NY: Springer.
6. Chechurin, L. (2016). Research and Practice on the Theory of Inventive Problem Solving –Linking Creativity, Engineering and Innovation. Cham, Switzerland: Springer.
7. Koh, J.H.L., Chai, C.S., Wong, B., Hong, H.-Y. (2015). Design Thinking for Education: Conceptions and Applications in Teaching and Learning. Singapore: Springer.
8. Corrigan, A.M (2010). Creativity: Fostering, measuring and contexts. New York: Nova Science Publishers, Inc.
Seznam literature se vsako leto aktualizira in dopolnjuje glede na področje oz. smeri poučevanja./The list of literature is updated annually and updated according to the area of teaching.

Cilji in kompetence:

1. Interdisciplinarno povezovanje vsebin.
2. Učinkovita ter fleksibilna organizacija prostora in časa: ureditev igralnice za različne dejavnosti in igro, kotički za igro in urnik, izbira didaktičnih in igralnih pripomočkov, fleksibilno časovno razporejanje dejavnosti in prehodov med njimi.
3. Prepoznavanje in upoštevanje individualnih potreb in drugih razlik med otroki (v osebnostnih lastnostih, sposobnostih, zmožnostih, kognitivnih stilih, družinskem oz. socialnokulturnem okolju ...) pri vzgojnem delu.
4. Negovanje radovednosti otrok, upoštevanje notranje motivacije in interesov, širjenje interesov ter spodbujanje.
5. Poznavanje timskega dela in sodelovanje v paru s pomočnico vzgojiteljice ali učiteljico, v kolektivu oz. strokovnem timu.

Objectives and competences:

1. Interdisciplinary subject matter linking.
2. Effective and flexible organisation of the classroom and time: arranging the playroom for different activities and games; playing corners, selection of teaching and playing tools; flexible scheduling of activities and transfer among them.
3. Recognition and consideration of individual needs of children and diversity (in their personal characteristics, abilities, cognitive styles, family and the socio-cultural environment, etc) in education.
4. Promotion of children's curiosity, consideration of their internal motivation and interests, expansion of interests and promotion of research and active learning.
5. Team and pair work skills for collaboration with educators or teachers in the collective or within a professional team.

Predvideni študijski rezultati:

Znanje in razumevanje:
1. študent pozna vsebine tehnike in tehnologije ter možnosti za njihovo vključitev v vzgojno in izobraževalno delo v vrtcu/šoli;
2. študent pozna metode in tehnike ustvarjalnega razmišljanja in razume dejavnike izbire;
3. študent pozna in razume dejavnike oblikovalskega razmišljanja za potrebe dejavnosti v vrtca/šole.

Uporaba:
1. zna pravilno izbrati orodja, pripomočke in svetovati pri ustvarjalnem in varnem delu otrok/učencev;

Intended learning outcomes:

Knowledge and Understanding:
1. student knows the content of the design and technology and the possibility of their inclusion in the educational work in kindergarten or Primary school;
2. student knows the methods and techniques of creative thinking and understands the factors of choice;
3. student knows and understands the factors of design thinking for the needs of activity in kindergarten / school.

Use:
1. student can correctly choose the tools and aids, and is able to advice at creative and safe work of children/pupils;

2. je sposoben učinkovito izbrati in izpeljati metode in tehnike ustvarjalnega razmišljanja in dela; 3. vodi projektno delo v vrtcu ali šoli od ideje do izvedbe in evalvacije. Refleksija: 1. kritično analizira, spremlja in ovrednoti svoje delo; 2. presoja uporabnost metod in tehnik ustvarjalnega razmišljanja za delo v vrtcu oz. šoli; 3. ovrednoti učinek ustvarjalnega dela glede na zastavljene cilje na osnovi teoretičnih izhodišč. Prenosljive spretnosti: 1. sodelovalno in timsko delo; 2. izkustveno delo »hands-on«; 3. upravljanje časa in organizacija učnega /delovnega okolja; 4. komunikacija: poročanje, opazovanje, zajem podatkov... 5. raba sodobnih tehnologij za iskanje in reševanje problemov; 6. kritična analiza in sinteza; 7. odločanje za izbiro; 8. proaktivnost.	2. student is able to select effectively and to implement methods and techniques of creative thinking and work. 3. student is able to lead the project work in kindergarten or Primary school from idea to execution and evaluation. Reflection: 1. student is able to critically analyse, to monitor and to evaluate their work; 2. student is able to judge on the applicability of methods and techniques of creative thinking to work in kindergartens or in Primary school; 3. student is able to evaluate the effect of creative work on the set goals based on theoretical backgrounds. Transferable skills: 1. collaborative work and teamwork; 2. experiential work “hands-on”; 3. time management and organization of the learning / work environment; 4. communication: reporting, observing, data collection ...; 5. the use of modern technologies to find and solve problems; 6. critical analysis and synthesis; 7. decision making; 8. proactivity.

Metode poučevanja in učenja:	**Learning and teaching methods:**
1. Interaktivna predavanja vključijo metode kot so: potrjevalno odkrivanje, reverzibilni inženiring, obrnjeno učenje, oblikovalsko razmišljanje, raba hevristik, IKT za razvijanje miselnih veščin višjega reda za dvig inventivnosti. Potekajo v kombinirani obliki. 2. Vaje potekajo v opremljeni delavnici z upoštevanjem varnostnih pravil. Preizkus izdelkov opravijo v vrtcih ali osnovni šoli. 3. Opremljena delavnica z orodji, napravami in stroji.	1. Interactive lectures include methods such as: appreciative inquiry, reversible engineering, flipped learning, design thinking, use of heuristics, ICT for developing of higher-order thinking skills to enhance inventiveness. They run in a form of blended learning/teaching. 2. Practical/laboratory classes are organized in the well-equipped workshop where safety rules are considered. Evaluation of products is done in kindergarten or in Primary school. 3. Workshop is well-equipped with modern tools, machines and devices.

Načini ocenjevanja:	**Delež (v %) / Weight (in %)**	**Assessment:**
Pisna dokumentacija projekta in praktična izvedba.	70	Written documentation of the project and practical implementation.

Pisna evalvacija preizkusa izdelka v vrtcu ali osnovni šoli.	30	A written evaluation of the product test in the kindergarten or in Primary school.

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Reference nosilca / Lecturer's references:

izr. prof. dr. Stanislav Avsec:

1. AVSEC, Stanislav, SAJDERA, Jolanta. Factors influencing pre-service preschool teachers' engineering thinking: model development and test. International journal of technology and design education, ISSN 1573-1804, 2018, vol. 29, issue , 28 p. https://link.springer.com/content/pdf/10.1007%2Fs10798-018-9486-8.pdf, doi: 10.1007/s10798-018-9486-8. [COBISS.SI-ID 12225865]
2. AVSEC, Stanislav, JAGIEŁŁO-KOWALCZYK, Magdalena. Pre-service teachers' attitudes towards technology, engagement in active learning, and creativity as predictors of ability to innovate. International journal of engineering education, ISSN 0949-149X, 2018, vol. 34, no. 3, str. 1049-1059, ilustr., graf. prikazi. http://pefprints.pef.uni-lj.si/5071/1/Pre-service.pdf. [COBISS.SI-ID 11992905].
3. SZEWCZYK-ZAKRZEWSKA, Agnieszka, AVSEC, Stanislav. Predicting academic success and creative ability in freshman chemical engineering students: a learning styles perspective. International journal of engineering education, ISSN 0949-149X, 2016, vol. 32, no. 2(A), 682-694. http://www.ijee.ie/latestissues/Vol32-2A/09_ijee3204ns.pdf.
4. AVSEC, Stanislav, SZEWCZYK-ZAKRZEWSKA, Agnieszka. Predicting academic success and technological literacy in secondary education: a learning styles perspective. International journal of technology and design education, ISSN 1573-1804, 2017, vol. 27, no., 2, pp. 233-250. http://link.springer.com/article/10.1007/s10798-015-9344-x, doi: 10.1007/s10798-015-9344-x. Readcube: http://rdcu.be/mEqQ and https://rdcu.be/6hFP.