UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Tehnologije aditivne proizvodnje
Course title:	Additive Manufacturing Technologies

Študijski program in stopnja **Study programme and level**	**Študijska smer** **Study field**	**Letnik** **Academic year**	**Semester** **Semester**
Sonaravne tehnologije in sistemi v strojništvu - 3. stopnja	/	1./2.	zimski/letni
Sustainable technologies and systems in mechanical engineering - 3rd cycle	/	first/second	winter/summer

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

Predavanja **Lectures**	**Seminar** **Seminar**	**Vaje** **Tutorial**	**Laboratorijske vaje** **work**	**Druge oblike študija**	**Samost. delo** **Individ. work**	**ECTS**
10		30	10	/	250	10

Nosilec predmeta / Lecturer:	prof. dr. Ognjan Lužanin

Jeziki / Languages:	**Predavanja / Lectures:**	angleški/english
	Vaje / Tutorial:	angleški/english

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisits:**
• Vpis v doktorski študijski program. • Dodatnih pogojev ni.	

Vsebina:	Content (Syllabus outline):
	• General overview on the meaning and role of additive manufacturing, comparison with conventional manufacturing technologies advantages and drawbacks. Classification of methods for additive manufacturing, according to ISO 17296 and ASTM F2792 - Vat photopolymerization, Powder bed fusion, Material extrusion, Material jetting, Binder jetting, Sheet lamination, Directed energy deposition (DED). General process flow in additive manufacturing. • Methods for generation of digital 3-D model as the basic input information for additive manufacturing. Vat photopolymerization - laser stereolithography (SLA), and photopolymerization by controlled area light source (DLP-SLA, LCD-SLA). Bed powder fusion - laser-based (SLS, SLM, DMLS), and Electron beam-based (EBM). Material extrusion (FDM). Material jetting (PolyJet, PolyJet Matrix). Binder jetting (3DP, slurry-based 3DP). Sheet lamination (LOM, PSL). Directed energy deposition (DED). • STL file for data exchange - structure of STL file. Key differences between 3-D model representation in STL and CAD format. Typical errors in STL data files and their impact on the generation of curing paths in layers.

Temeljni literatura in viri / Readings:

1. Bártolo, P. J. (Ed.). (2011) Stereolithography: materials, processes and applications. Springer Science & Business Media.
2. Dahotre, N. B., & Harimkar, S. (2008) Laser fabrication and machining of materials. Springer Science & Business Media.
3. Gibson, I., Rosen, D. W., & Stucker, B. (2010) Additive manufacturing technologies. New York: Springer.
4. Liou, F. W. (2007) Rapid prototyping and engineering applications: a toolbox for prototype development. CRC Press.

Cilji in kompetence:	Objectives and competences:
	• Provide detailed knowledge of the principles of additive manufacturing (AM) technologies; • Provide required techniques and skills for application of specialized softwares in the AM-specific domain; • Develop ability in students to apply theoretical knowledge to solving practical engineering problems in the domain of additive manufacturing;

Predvideni študijski rezultati:	Intended learning outcomes:
Znanje in razumevanje:	Knowledge and understanding: • Understanding of key AM technologies and physical/chemical mechanisms in the background of particular processes; • Knowledge to prepare input data for AM; • Ability to select most appropriate AM technology for the given problem; • Ability to work with the software applications required to solve practical AM-related problems.

Metode poučevanja in učenja:	Learning and teaching methods:
	• Lectures; • Computer-interactive and laboratory practice; • Term paper.

Načini ocenjevanja:	Delež (v %) / Weight (in %)	Assessment:
Način (pisni izpit, ustno izpraševanje, naloge, projekt)	25% 60% 15%	Type (examination, oral, coursework, project): • Term paper • Tests • Oral examination