



**UČNI NAČRT PREDMETA / SUBJECT SPECIFICATION**

<b>Predmet:</b>	Sodobna gradiva in obdelovalne tehnologije
<b>Subject Title:</b>	Advanced material and production technologies

Študijski program Study programme	Študijska smer Study field	Letnik Year	Semester Semester
Tehnika – področje izobraževanja		1	zimski
Education in Engineering		1	Winter

Univerzitetna koda predmeta / University subject code:

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Labor work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
15	10				155	6

Nosilec predmeta / Lecturer:

Jeziki / Languages: **Predavanja / Lecture:**   
**Vaje / Tutorial:**

**Pogoji za opravljanje študijskih obveznosti:**

Osnovno znanja o gradivih, obdelovalnih tehnologijah in načrtovanju proizvodnje

**Vsebina:**

Predavanja:

**Sodobna gradiva.**

kompozitna gradiva;  
super legure;  
nano gradiva;  
pametna gradiva.

**Sodobne tehnologije.**

obdelava z abrazivnim tokom (plazma, laser,...);  
obdelava z vodnim curkom (VC);  
obdelava z abrazivnim VC (AVC);  
obdelava polne oblike;  
hidrodinamična obdelava;  
NC/CNC/DNC tehnologije;  
CAD - CAM sistemi.

**Računalniško podprte tehnologije načrtovanja in vodenja proizvodnje.**

Seminar:

Seminar aplikativno dopolnjuje vsebino predavanj z reševanjem praktičnih problemov.

**Prerequisites:**

Basic knowledge of material, productional technologies and planning of the production.

**Content (Syllabus outline):**

Lectures:

**Contemporary material.**

composites;  
super alloys;  
nano materials;  
smart materials.

**Contemporary technologies.**

machining with abrasive flow (plazma, laser, ...);  
machining with water jet;  
machining with abrasive water jet;  
total form machining  
Hydro dynamical machining  
NC/CNC/DNC technologies;  
CAD - CAM systems.

**Computer aided technologies for planning and managing production.**

Seminar:

Seminar work supplements the lectures with the solutions of the practical problems.

**Temeljni literatura in viri / Textbooks:**

Aberšek, B., *Tehnologija in obdelava gradiv*, Didakta, Radovlica, 1995  
Balič, J., *Flexsible manufacturing systems*, DAAAM Publishing, Vienna, 2001  
MacInnes, R.L. and Pearce, S.L., *Strategic MRO powered by DSC*, Net Results Inc., Kentucky, 2002  
Zhong, L.W., Ze, Z., Liu, Y., *Handbook of Nanophase and Nanostructured Materials*, Kluwer

**Cilji:**

podati znanja in informacij o sodobnih gradivih v tehnični praksi ter sodobnih tehnologijah, ki se danes vse pogosteje uporabljajo;  
 podati poglobljeno teoretično znanje s področja vrednotenja in izbire posameznih gradiv;  
 podati poglobljeno teoretično znanje s področja vrednotenja in izbire sodobnih obdelovalnih tehnologij;  
 podati poglobljena znanja o načrtovanju in vodenju proizvodnje;  
 prikazati praktično uporabo predhodno pridobljenih teoretičnih znanj na praktičnih primerih;  
 spodbujanje študentov k kreativnemu in samostojnemu razmišljanju in razvijanju sposobnosti za kreativno reševanje inženirskih problemov.

**Predvideni študijski rezultati:**Znanje in razumevanje:

poznavanje splošnih napotkov in pravil za izbiro gradiv in ustreznih obdelovalnih tehnologij;  
 poznavanje načinov za učinkovito načrtovanje proizvodnega procesa;  
 poznavanje splošnih kriterijev za izbiro gradiv in ustreznih tehnologij;  
 poznavanje metod in smernic za tehnološki razvoj izdelka;  
 poznavanje sodobnih računalniških metod za tehnološko načrtovanje proizvodnje;  
 razumevanje sovisnosti različnih znanj in postopkov ter pomena uporabe strokovne literature in računalniških sistemov za učinkovito reševanje praktičnih problemov.

Prenesljive/ključne spretnosti in drugi atributi:

*Uporaba informacijske tehnologije:* uporaba orodij za izdelavo in oblikovanje .  
*Reševanje problemov:* ocenjevanje obstoječih in lastnih tehnoloških rešitev.  
 kombinirana uporaba različnih znanj za reševanje praktičnih problemov;  
 načrtovanje tehnologije za izdelavo izdelka z uporabo sodobnih metod.

**Metode poučevanja in učenja:**

frontalna predavanja,  
 skupinsko delo;  
 izdelava seminarske naloge,  
 diskusije v elektronskem forumu,  
 e-učenje.

**Načini ocenjevanja:**

Način (pisni izpit, ustno izpraševanje, naloge, projekt):  
 diskusije v elektronskem forumu,  
 seminarske naloge,  
 pisni izpit,  
 ustni izpit.

**Objectives:**

To present knowledge and information about contemporary materials used in technical praxes as modern technologies, mostly connected with production;  
 to provide detailed theoretical knowledge from area of assessment and selection of contemporary materials;  
 to provide detailed theoretical knowledge from area of assessment and selection of contemporary production technologies;  
 to provide detailed theoretical knowledge about planning and management of the production;  
 to demonstrate practical use of previously accumulated theoretical knowledge on the practical examples.  
 to encourage the students to creative and independent thinking for developing and solving different engineering problems.

**Intended learning outcomes:**Knowledge and understanding:

knowledge of general instructions and rules for selecting materials and suitable production technologies;  
 knowledges for effective planning of productional technologies;  
 knowledge of general criteria for selecting materials and adequate production technologies;  
 knowledge of methods and guidelines for technological product development;  
 knowledge of advanced computer aided methods for technological planning of the productin;  
 understanding of relationships between different skills and procedures and importance of professional literature and computer systems for efficient solutions of practical problems.

Transferable/Key Skills and other attributes:

use of information technology: use of tools for creating and designing technological process;  
 problem solving: evaluation of existing and proper program solutions;  
 combined use of different skills for solution of practical problems;  
 design of technological process using advanced approaches.

**Teaching and learning methods:**

frontal lectures,  
 work in small groups;  
 seminar work,  
 discussion in electronic forums,  
 e-learning.

Delež (v %) /  
 Weight (in %)

**Assessment methods:**

Delež (v %) / Weight (in %)	Type (examination, oral, coursework, project):
20 %	discussion in electronic forums,
40 %	seminar works,
20 %	written examination,
20 %	oral examination.