Univerza v Mariboru
University of Maribor

FAKULTETA *za*
NARAVOSLOVJE *in*
MATEMATIKO
FACULTY *OF*
NATURAL SCIENCE *and*
MATHEMATICS

UČNI NAČRT PREDMETA / SUBJECT SPECIFICATION

Predmet:	Mehanizmi
Subject Title:	Mechanisms

Študijski program **Study programme**	**Študijska smer** **Study field**	**Letnik** **Year**	**Semester** **Semester**
Tehnika – področje izobraževanja		1	letni
		ali	
		2	zimski
Education in Engineering		1	Summer
		or	
		2	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: Karl Gotlih

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

Pogoji za opravljanje študijskih obveznosti:	**Prerequisites:**
Ni posebnih pogojev	No prerequisites

Vsebina:

Vsebina je razdeljena na poglavja: Uvod in klasifikacija mehanizmov; Prostostne stopnje mehanizmov; Vektorske in matrične metode za opis geometrije mehanizmov (opis s kompleksnimi števili in Denavit Hartenbergova notacija s homogenimi transformacijskimi matrikami); Posebnosti opisa odprtih in zaprtih kinematičnih verig; Kinematika (hitrosti in pospeški na mehanizmu); Direktna in inverzna kinematična naloga; Kinetična in dinamična analiza mehanizmov; Direktna in inverzna dinamična naloga; Metode sinteze mehanizmov; Delovni prostori in njihove lastnosti pri odprtih kinematičnih verigah.

Content (Syllabus outline):

The course comprises the following chapters: Introduction and classification of mechanisms; Degrees of freedom; Vector and matrix methods for geometrical description of mechanisms (description with complex numbers and the Denavit Hartenber notation with homogeneous transformation matrices); Open and closed kinematical chains; Kinematics (velocities and accelerations on the mechanism); Direct and inverse kinematic problem; Kinetic and dynamic analysis of mechanisms; Direct and inverse dynamic problem; Methods of mechanism synthesis; Workspace and its properties for open kinematic chain structures.

Temeljni literatura in viri / Textbooks:

- Erdman, G. Sandor: Machine design, Prentice Hall, 2001
- Erdman, G. Sandor: Mechanism design I, Prentice Hall, 1997
- J. Grosjean: Kinematics and Dynamics of mechanisms, McGraw-Hill, 1991
- H. Soni: Mechanism Synthesis and Analysis, McGraw-Hill, 1974
- S. Molian: Mechanism Design, Pergamon, 1997

Cilji:	**Objectives:**

| Podati študentom znanja, ki jim omogočajo kvalitetno projektiranje, analizo in sintezo mehanizmov. | To provide knowledge, which enable high quality design, analysis and synthesis of mechanisms. |

Predvideni študijski rezultati:

Intended learning outcomes:

Znanje in razumevanje: Prepoznavanje mehanizmov, poznavanje metod notacije in analiza in sinteza mehanizmov.	Knowledge and understanding: Identification of mechanisms, provide knowledge of methods for notation, analysis and synthesis of mechanisms.
Prenesljive/ključne spretnosti in drugi atributi: *Spretnosti komuniciranja:* javna predstavitev seminarskega dela, pisno izražanje pri pisnem izpitu. *Uporaba informacijske tehnologije:* uporaba programskih orodij za modeliranje, sintezo in analizo mehanizmov. *Reševanje problemov:* modeliranje mehanizmov. *Delo v skupini:* skupinsko delo pri seminarju in laboratorijskih vajah.	Transferable/Key Skills and other attributes: *Communication skills:* public presentation of seminary work, manner of expression at written examination. *Use of information technology:* use of programming tools for modelling, synthesis and analysis of mechanisms. *Problem solving:* modelling of mechanisms. *Working in a group:* group work at the seminar and lab work.

Metode poučevanja in učenja:

Teaching and learning methods:

| • Predavanja
• seminarsko delo v skupini
• praktično delo na vajah | • lectures
• seminar team work
practical laboratory work |

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment methods:**
Način (pisni izpit, ustno izpraševanje, naloge, projekt): • seminarska naloga, • pisni izpit, • ustni izpit.	**30 %** **40 %** **30 %**	Type (examination, oral, coursework, project): • seminar work, • written examination, • oral examination.