



Univerza v Mariboru

Fakulteta za naravoslovje  
in matematiko

### UČNI NAČRT PREDMETA / COURSE SYLLABUS

<b>Predmet:</b>	<b>Fizika tekočin</b>
<b>Course title:</b>	<b>Fluid Physics</b>

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Fizika		3	6
Physics			

Vrsta predmeta / Course type:

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Lab. vaje Laboratory work	Terenske vaje Field work	Samost. delo Individ. work	ECTS
45		15			120	6

Nosilec predmeta / Lecturer:

Jeziki / Predavanja / Lectures:   
Languages: Vaje / Tutorial:

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

**Prerequisites:**

**Vsebina:**

Osnove mehanike kontinuov.  
Hidrostatika: osnovne enačbe.  
Plimovanje.  
Hidrodinamika: osnovne enačbe.  
Idealne tekočine: Eulerjeva enačba.  
Vrtinčnost.  
Bernoullijeve enačbe.  
Nestisljive tekočine.  
Dvodimenzionalni idealni tok.  
Teorija kril.  
Kapilarni efekt.  
Turbulenca.  
Tekoči kristali.  
Superfuidi.

**Content (Syllabus outline):**

Basics of continuum mechanics.  
Hydrostatics: basic equations.  
Tide oscillations.  
Hydrodynamics: basic equations.  
Ideal liquids: Euler equations.  
Vorticity  
Bernoulli equations.  
Incompressible liquids.  
Two-dimensional ideal stream.  
Theory of wings.  
Capilar effect.  
Turbulence.  
Liquid crystals.  
Superfluids.

### Temeljni literatura in viri / Readings:

1. L. D. Landau, E. M. Lifshitz, Fluid Mechanics (Pergamon Press, Oxford, 1989).
2. I. G. Currie, Fundamental mechanics of fluids (McGraw Hill, New York, 1993).
3. D. J. Acheson, Elementary fluid dynamics (Oxford university press, Oxford, 1990).

### Cilji in kompetence:

Študenti usvojijo znanje s področja fizike tekočin.

### Objectives and competences:

Students acquire knowledge on fluid physics.

### Predvideni študijski rezultati:

#### Znanje in razumevanje:

Razumevanje osnovnih pojavov v tekočinah.

#### Prenesljive/ključne spretnosti in drugi atributi:

Razumevanje procesov v tehnologiji povezanih s fiziko tekočin.

### Intended learning outcomes:

#### Knowledge and understanding:

Understanding of basic processes in liquids.

#### Transferable/Key Skills and other attributes:

Understanding of technological processes related to fluids.

### Metode poučevanja in učenja:

Metodika obsega: teoretičen uvod v problematiko in analitično ali numerično reševanje posameznih problemov.  
Domače računske vaje

### Learning and teaching methods:

They are based on: theoretical introduction and analytic or numerical solving of specific problems.  
Home theoretical exercises

### Načini ocenjevanja:

Delež (v %) /

Weight (in %)

### Assessment:

Način (pisni izpit, ustno izpraševanje, naloge, projekt)  
2 pisna kolokvija ali pisni izpit  
ustni izpit  
daljša seminarska naloga

50

50

Type (examination, oral, coursework, project):  
2 written tests or written or exam  
oral exam  
longer seminar work

### Reference nosilca / Lecturer's references:

AMBROŽIČ, Milan, KOSMAČ, Tomaž. Optimization of the bend strength of flat-layered alumina-zirconia composites. *J. Am. Ceram. Soc.*, vol. 90, 2007, str. 1545-1550. [COBISS.SI-ID [20741415](#)]

AMBROŽIČ, Milan, KRALJ, Samo, VIRGA, Epifanio G. Defect-enhanced nematic surface order reconstruction. *Phys. rev., E Stat. nonlinear soft matter phys. (Print)*, 2007, vol. 75, no. 3, str. 031708-1-031708-9. [COBISS.SI-ID [20736807](#)]

CVETKO, Matej, AMBROŽIČ, Milan, KRALJ, Samo. Competition between local disordering and global ordering fields in nematic liquid crystals. *Beilstein journal of organic chemistry*, 2010, vol. 6, no. 2, str. 1-14. <http://dx.doi.org/10.3762/bjoc.6.2>, doi: [10.3762/bjoc.6.2](https://doi.org/10.3762/bjoc.6.2). [COBISS.SI-ID [17410312](#)]

ZIDANŠEK, Aleksander, AMBROŽIČ, Milan, MILFELNER, Maja, BLINC, Robert, LIOR, Noam. Solar orbital power : sustainability analysis. *Energy (Oxford)*. [Print ed.], 2011, vol. 36, no. 4, str. 1986-1995. [COBISS.SI-ID [24602919](#)]

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GORJAN, Lovro, AMBROŽIČ, Milan. Bend strength of alumina ceramics : a comparison of Weibull statistics with other statistics based on very large experimental data set. *J. Eur. Ceram. Soc.*. [Print ed.], 2012, vol. 32, no. 6, str. 1221-1227, doi: [10.1016/j.jeurceramsoc.2011.12.010](https://doi.org/10.1016/j.jeurceramsoc.2011.12.010). [COBISS.SI-ID [25578279](https://www.cobiss.si/id/25578279)]