

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Izbrana poglavja iz meteorologije
Course name:	Selected topics in meteorology

Študijski program in stopnja Study program and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Fizika in Astrofizika I. stopnja	/	3	1
Physics and Astrophysics I. level	/	3	1

Vrsta predmeta / Course type	obvezni / mandatory
Univerzitetna koda predmeta / University course code:	1FAF23

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Lab. work	Teren. vaje Field work	Samost. delo Indiv. work	ECTS
45	/	15	/	/	120	6

Nosilec predmeta / Lecturer:	Izr. prof. dr. Klemen Bergant	
Jeziki / Languages:	Predavanja / Lectures:	slovenščina / English
	Vaje / Tutorial:	slovenščina / English

Pogoji za opravljanje študijskih obveznosti: Prerequisites:

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Vsebina:	Syllabus outline:
<p>1. Sestava in struktura atmosfere</p> <p>2. Termodinamika atmosfere</p> <ul style="list-style-type: none"> - zakoni termodinamike - vodna para v zraku - stabilnost ozračja <p>3. Sevanje in atmosfera</p> <ul style="list-style-type: none"> - spekter sevanja - sevanje črnega telesa - sipanje, absorpcija in emisija - prehod sevanja skozi ozračje - sevalna bilanca na vrhu ozračja <p>4. Dinamika atmosfere</p> <ul style="list-style-type: none"> - kinematika zračnih tokov - dinamika zračnih tokov - osnovni sistem enačb - kroženje ozračja <p>5. Meritve lastnosti ozračja</p> <ul style="list-style-type: none"> - prizemne meritve osnovnih meteoroloških spremenljivk - daljinsko zaznavanje atmosfere 	<p>1. Composition and Structure of Atmosphere</p> <p>2. Atmospheric Thermodynamics</p> <ul style="list-style-type: none"> - Thermodynamic laws - Water Vapour in the Air - Static Stability <p>3. Radiative Transfer</p> <ul style="list-style-type: none"> - The Spectrum of Radiation - Blackbody Radiation - Scattering, Absorption and Emission - Radiative Transfer in the Atmosphere - Radiation Balance at the Top of Atm. <p>4. Atmospheric Dynamics</p> <ul style="list-style-type: none"> - Kinematics of Air Flow - Dynamics of Air Flow - Primitive Equations - Atmospheric Circulation <p>5. Measurements of atmospheric properties</p> <ul style="list-style-type: none"> - ground-based measurements of classical meteorological observables - remote sensing of the atmosphere

Temeljni literatura in viri / Basic readings:

J. M. Wallace & P. V. Hobbs, Atmospheric Science – An Introductory Survey (Chapters 1, 3, 4, 6, 7), Elsevier / Academic Press, 2nd edition

J. Rakovec, T. Vrhovec, *Osnove meteorologije*, DMFA, Ljubljana, 2000

D. G. Andrews, Introduction to Atmospheric Physics (Chapters 1, 2, 3, 4, 5), Cambridge University Press, 1st edition, 2000

J. Houghton, The Physics of Atmospheres (Chapters, 1, 2, 3, 4, 6, 7, 8, 10), Cambridge University Press, 1st edition, 2002

M. L. Salby, Fundamentals of Atmospheric Physics (All Chapters), Elsevier / Academic Press, 1st edition, 1996

Cilji in kompetence:	Objectives and competences:
- seznanitev slušateljev z osnovnimi fizikalnimi procesi v ozračju	- introduction to basic physical processes in the atmosphere
- razumevanje vpliva procesov v ozračju na vreme oziroma podnebje	- understanding the impact of the processes on weather and climate phenomena

Predvideni študijski rezultati:	Intended learning outcomes:
- nadgradnja in uporaba predhodnega znanja o termodinamiki, sevanju in dinamiki pri proučevanju fizikalnih lastnosti ozračja in njihovega vpliva na vreme in podnebje	- application of basic knowledge in thermodynamics, radiation and dynamics to the physical properties of the atmosphere and their impact on weather and climate

Metode poučevanja in učenja:	Learning and teaching methods:
- predavanja - eksperimentalne vaje - računske vaje - seminar	- lectures - laboratory work - tutorial - seminar

Načini ocenjevanja:	Utež / Weight (%)	Assessment:
<ul style="list-style-type: none"> • kolokviji, pisni izpit • ustni izpit • seminar 	<p>40</p> <p>40</p> <p>20</p>	<ul style="list-style-type: none"> • written tests, written exam • oral exam • seminar

Reference nosilca / references of the course principal:

Dr. Klemen Bergant je pridružen profesor ranga izredni profesor za področje meteorologije na Univerzi v Novi Gorici.

Dr. Klemen Bergant is Adjunct Professor of Meteorology at the University of Nova Gorica.

1. WANG, Longlong, STANIČ, Samo, BERGANT, Klemen, EICHINGER, William, MOČNIK, Griša, DRINOVEC, Luka, VAUPOTIČ, Janja, MILER, Miloš, GOSAR, Mateja, GREGORIČ, Asta. Retrieval of vertical mass concentration distributions : Vipava valley case study. Remote

sensing, ISSN 2072-4292, 2019, vol. 11, iss. 2, str. 1-20, ilustr. <https://doi.org/10.3390/rs11020106>, doi: 10.3390/rs11020106. [COBISS.SI-ID 5310715]

2. MOLE, Maruška, WANG, Longlong, STANIČ, Samo, BERGANT, Klemen, EICHINGER, William, OCAÑA, Francisco, STRAJNAR, Benedikt, ŠKRABA, Primož, VUČKOVIĆ, Marko, WILLIS, William B. Lidar measurements of Bora wind effects on aerosol loading. *Journal of quantitative spectroscopy & radiative transfer : JQSRT*, ISSN 0022-4073. [Print ed.], Feb. 2017, vol. 188, str. 39-45, doi: 10.1016/j.jqsrt.2016.05.020. [COBISS.SI-ID 4626939]

3. GAO, Fei, STANIČ, Samo, BERGANT, Klemen, LI, Ying, LI, Songhui, HUA, Dengxin, WANG, Longlong. Application of the ultraviolet scanning elastic backscatter LiDAR for the investigation of aerosol variability. *Remote sensing*, ISSN 2072-4292, 2015, vol. 7, iss. 5, str. 6320-6335, ilustr. <http://dx.doi.org/10.3390/rs70506320>, doi: 10.3390/rs70506320. [COBISS.SI-ID 3894267]

4. GAO, Fei, STANIČ, Samo, BERGANT, Klemen, BOLTE, Tanja, COREN, Franco, HE, Tingyao, HRABAR, Andrej, JERMAN, Jure, MLADENOVIČ, Ana, TURŠIČ, Janja, VEBERIČ, Darko, IRŠIČ ŽIBERT, Mateja. Monitoring presence and streaming patterns of Icelandic volcanic ash during its arrival to Slovenia. */Biogeosciences/*, ISSN 1726-4170, 2011, vol. 8, no. 8, str. 2351-2363, doi: 10.5194/bg-8-2351-2011. [COBISS.SI-ID 1977339]

5. BERGANT, Klemen, BELDA, Michal, HALENKA, Tomáš. Systematic errors in the simulation of european climate (1961-2000) with RegCM3 driven by NCEP/NCAR reanalysis. *International journal of climatology*, ISSN 0899-8418, 2007, vol. 27, str. 455-472. [COBISS.SI-ID 695547]

6. BERGANT, Klemen, KAJFEŽ-BOGATAJ, Lučka, TRDAN, Stanislav. Uncertainties in modelling of climate change impact in future : an example of onion thrips (*Thrips tabaci* Lindeman) in Slovenia. V: DEBELJAK, Marko (ur.), DŽEROSKI, Sašo (ur.), ŽENKO, Bernard (ur.). *Selected papers from the Fourth European Conference on Ecological Modelling*, September 27-October 1, 2004, Bled, Slovenia, (Ecological modelling, ISSN 0304-3800, vol. 194, issues 1-3, 2006). Amsterdam: Elsevier. 2006, vol. 194, no. 1-3, str. 244-255. [COBISS.SI-ID 4481913]