UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Letalska meteorologija
Course title:	AERONAUTICAL METEOROLOGY
Članica nosilka/UL Member:	UL FS

Študijski programi in stopnja	Študijska smer	Letnik	Semestri
Strojništvo - projektno aplikativni program, prva stopnja, visokošolski strokovni	Prometni pilot letala/helikopterja (smer)	2. letnik	2. semester

Univerzitetna koda predmeta/University course code:	0563996
Koda učne enote na članici/UL Member course code:	3082-V

Predavanja	Seminar	Vaje	Klinične vaje	Druge oblike študija	Samostojno delo	ECTS
50		30			95	7

Nosilec predmeta/Lecturer:	Gregor Skok

Vrsta predmeta/Course type:	Izbirni strokovni predmet /Elective specialised course

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

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisites:**
Izpolnjevanje pogojev za vpis v Visokošolski strokovni študijski program I. stopnje Strojništvo - Projektno aplikativni program.	Meeting the enrollment conditions for the MECHANICAL ENGINEERING - Project Oriented Applied Programme.

Vsebina:	**Content (Syllabus outline):**
1. Vsebina 1. Predavanja: - Sestava ozračja, - Značilne plasti ozračja, - Mednarodna standardna atmosfera. 2. Vsebina 2. Predavanja: - Meteorološke spremenljivke, - Definicija vremena in klime, - Plinska enačba. 3. Vsebina 3. Predavanja: - Vlažnost zraka, - Meteorološke meritve,	1. Contents 1. Lectures : - Composition of the atmosphere, - Characteristic layers of the atmosphere, - International standard atmosphere . 2. Contents 2. Lectures : - Meteorological variables, - Definition of weather and climate, - Gas equation . 3. Contents 3. Lectures : - Humidity, - Meteorological measurements,

- Sprememba zračnega tlaka z vision.	- Change the air pressure with vision.
4. Vsebina 4. Predavanja:	4. Contents 4. Lectures :
- Termodinamska energijska enačba,	- Thermodynamic energy equation,
- Sprememba temperature pri dviganju in spuščanju zraka,	- Change in temperature when raising and lowering the air,
- Prosta konvekcija.	- Simple convection .
5. Vsebina 5. Predavanja:	5. Contents 5. Lectures :
- Statična stabilnost plasti zraka,	- Static stability of the air layer,
- Primeri zelo stabilnih plasti,	- Examples of very stable layers,
- Konvektivna stabilnost atmosphere.	- Convective atmosphere stability .
6. Vsebina 6. Predavanja:	6. Contents 6. Lectures :
- Nastanek oblakov,	- Cloud formation ,
- Oblike in rodovi oblakov,	- Cloud forms and clasification,
- Megla,	- Fog,
- Padavine,	- Precipitation,
- Nevihte.	- Storms .
7. Vsebina 7. Predavanja:	7. Contents 7 . lectures :
- Skalarna polja,	- Scalar fields,
- Izolinije in gradient,	- Isogonals and gradient,
- Advekcija,	- Advection,
- Gibalna enačba in sile,	- Equation of motion and forces,
- Stacionarni vetrovi v višinah.	- Stationary winds in heights .
8. Vsebina 8. Predavanja:	8. Contents 8. Lectures :
- Vpliv trenja na stacionarne vetrove,	- Impact of friction on stationary winds,
- Prizemna plast in turbulence,	- Ground layer and turbulence,
- Vremenske fronte.	- Time fronts .
9. Vsebina 9. Predavanja:	9. Content of the lecture :
- Lokalni vetrovi,	- Local winds,
- Kontinuitetna enačba,	- Continuity equation,
- Sončno in terestično sevanje.	- Solar and terrestrial radiation .
10. Vsebina 10. Predavanja:	10. Contents 10. Lectures :
- Prehod sevanja skozi ozračje in sipanje,	- Passage of radiation through the atmosphere and scattering,
- Energija sončnega sevanja pri tleh.	- Solar energy at the ground .
11. Vsebina 11. Predavanja:	11. Contents 11. Lectures :
- Ravnovesna temperatura Zemlje in učinek tople grede,	- Earth's equilibrium temperature and greenhouse effect,
- Podnebne spremembe in globalno segrevanje.	- Climate change and global warming.
12. Vsebina 12. Predavanja:	12. Contents 12. Lectures :
- Globalna cirkulacija.	- Global circulation .
13. Vsebina 13. Predavanja:	13. Contents 13. Lectures :
- Numerična napoved vremena.	- Numerical weather forecast .
14. Vsebina 14. Predavanja:	14. Contents 14. Lectures :
- Nevarnosti pri letenju.	- hazards in flight.
15. Vsebina 15. Predavanja:	15. Contents 15. Lectures :
- Meteorološke informacije.	- Meteorological information.

Temeljna literatura in viri/Readings:

1. J. Rakovec in T. Vrhovec, Osnove meteorologije za naravoslovce in tehnike. DMFA.
2. S. Gaberšek, G. Skok in R. Žabkar: Rešene naloge iz osnov meteorologije. DMFA.
3. J. M. Wallace in P. V. Hobbs: Atmospheric Science, Second Edition: An Introductory Survey. International Geophysics Series. Academic Press.

4. METEOROLOGY, ATPL GROUND TRAINING SERIES, CAE Oxford Aviiation Academy, BOOK NINE, EASA FIRST EDITION, REVISED FOR NPA 29, 2015
5. EASA ATPL Training, Meteorology, Jeppesen, 2019

Cilji in kompetence:	**Objectives and competences:**
Cilji:	Objectives :
1. Prepoznavanje oblakov in vremena 2. Prepoznavanje nevarnega vremena 3. Branje vremenkih napovedi in kart 4. Osnovno razumevanje procesov v ozračju in postopka priprave vremenske napovedi	1. Cloud and weather recognition 2. Hazardous weather recognition 3. Read weather forecasts and maps 4. Basic understanding of the processes in the calculus and the process of preparing the weather forecast
Kompetence:	Competencies:
1. S1-PAP, S2-PAP: Sposobnost prepoznavanja vremena. 2. S4-PAP, S14-PAP: Sposobnost analize vremena in nevarnih vremenskih pojavov. 3. P1-PAP: Sposobnost brati in razumeti letalske napovedi in stanja vremena. 4. P2-PAP: Sposobnost razumevanja procesov v ozračju in postopka priprave napovedi.	1. S1-PAP, S2-PAP: Sp time recognition personality. 2. S4-PAP, S14-PAP: Ability to analyze weather and hazardous weather events. 3. P1-PAP: Ability to brother and understand flight forecasts and weather conditions. 4. P2-PAP: Ability to understand atmospheric processes and forecasting process.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanja:	Knowledge:
Z1: Razumevanje procesov v ozračju in postopka pripave vremenskih napovedi, razumevaje različnih vremenjskih stanj in pravilno tolmačenje vremenskih podatkov in napovedi.	Z1: Understanding the processes in the atmosphere and the process of preparing weather forecasts, understanding the different weather conditions, and correctly interpreting weather data and forecasts .
Spretnosti:	Skills:
S1.1 Sposobnost vrednotenja in razumevanja vremenskih podatkov ter napovedi in pravilno ukrepanje na osnovi the podatkov in napovedi.	S1.1 Ability to evaluate and understand weather data and forecasts and to act on the basis of these data and forecasts .
S1.2 Izvajanje kompleksnih operativno-strokovnih opravil, ki vključujejo tudi uporabo metodoloških orodij.	S1.2 Executing complex operationa-professional tasks that incorporate usage of methodological tools.
S1.3 Obvladovanje zahtevnih, kompleksnih delovnih procesov ob samostojni uporabi znanja v novih delovnih situacijah.	S1.3 Mastering demanding and complex work processes by independent usage of knowledge in new working situations.
S1.4 Diagnosticiranje in reševanje problemov v različnih specifičnih delovnih okoljih, povezanih s področjem izobraževanja in usposabljanja.	S1.4 Problem diagnostics and solving in different and specific working environments that are linked to the teaching and training content.
S1.5 Osnova za izvirna dognanja/ stvaritve in kritično refleksijo.	S1.5 Basis for unique innovations and critical reflections.

Metode poučevanja in učenja:	**Learning and teaching methods:**
P1 Avditorna predavanja z reševanjem izbranih - za področje značilnih - teoretičnih in praktično uporabnih	P1 Auditorial lectures with solving selected field-specific theoretical and applied use cases.

primerov.	P2 Presenting the content according to the explained system.
P2 Obravnava snovi po urejeni in vnaprej razloženi sistematiki.	
	P3 Auditorial execises, in which theoretical content from the lectures is supplemented with practical examples.
P3 Avditorne vaje, kjer se teoretično znanje s predavanj podkrepi z računskimi primeri.	
P6 Interaktivna predavanja	P6 Interactive lectures.
P7 Študij literature in razprava	P7 Literature study and discussion.
P8 Izdelava in predstavitev aplikativnih seminarskih nalog	P8 Making and presenting applied seminar exercises.

Načini ocenjevanja: **Delež/Weight** **Assessment:**

Teoretične vsebine (predavanja):	50,00 %	Theoretical content (lectures):
Samostojno delo na vajah:	50,00 %	Independent work in exercises:

Reference nosilca/Lecturer's references:

Gregor Skok

1. **SKOK, Gregor**, HLADNIK, Veronika. Verification of gridded wind forecasts in complex alpine terrain: a new wind verification methodology based on the neighborhood approach. Monthly weather review, ISSN 0027-0644, 2018, vol. 146, no. 1, str. 63-75, ilustr., doi: 10.1175/MWR-D-16-0471.
2. **SKOK, Gregor**, BACMEISTER, Julio T., TRIBBIA, Joe. Analysis of tropical cyclone precipitation using an object-based algorithm. Journal of climate, ISSN 0894-8755, 2013, vol. 26, iss. 8, str. 2563-2579.
3. **SKOK, Gregor**, ŽAGAR, Nedjeljka, HONZAK, Luka, ŽABKAR, Rahela, RAKOVEC, Jože, CEGLAR, Andrej. Precipitation intercomparison of a set of satellite- and raingauge-derived datasets, ERA Interim reanalysis, and a single WRF regional climate simulation over Europe and the North Atlantic. Theoretical and applied climatology, ISSN 0177-798X. [Tiskana izd.], 2016, vol. 123, iss. 1, str. 217-232.
4. STRŽINAR, Gregor, **SKOK, Gregor**. Comparison and optimization of radar-based hail detection algorithms in Slovenia. Atmospheric research, ISSN 0169-8095. [Print ed.], 2018, vol.
5. 203, str. 275-285.
6. KOZJEK, Katja, DOLINAR, Mojca, **SKOK, Gregor**. Objective climate classification of Slovenia. International journal of climatology, ISSN 0899-8418, 2017, vol. 37, iss. S1, str. 848-860.