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. 4. Vsebina 4. Predavanja: - Termodinamska energijska enačba, - Sprememba temperature pri dviganju in spuščanju zraka, - Prosta konvekcija. 5. Vsebina 5. Predavanja: - Statična stabilnost plasti zraka, - Primeri zelo stabilnih plasti, - Konvektivna stabilnost atmosphere. 6. Vsebina 6. Predavanja: - Nastanek oblakov, - Oblike in rodovi oblakov, - Megla, - Padavine, - Nevihte. 7. Vsebina 7. Predavanja: - Skalarna polja, - Izolinije in gradient, - Advekcija, - Gibalna enačba in sile, - Stacionarni vetrovi v višinah. 8. Vsebina 8. Predavanja: - Vpliv trenja na stacionarne vetrove, - Prizemna plast in turbulence, - Vremenske fronte. 9. Vsebina 9. Predavanja: - Lokalni vetrovi, - Kontinuitetna enačba, - Sončno in terestično sevanje. 10. Vsebina 10. Predavanja: - Prehod sevanja skozi ozračje in sipanje, - Energija sončnega sevanja pri tleh. 11. Vsebina 11. Predavanja: - Ravnovesna temperatura Zemlje in učinek tople grede, - Podnebne spremembe in globalno segrevanje. 12. Vsebina 12. Predavanja: - Globalna cirkulacija. 13. Vsebina 13. Predavanja: - Numerična napoved vremena. 14. Vsebina 14. Predavanja: - Nevarnosti pri letenju. 15. Vsebina 15. Predavanja: - Meteorološke informacije.	- Change the air pressure with vision. 4. Contents 4. Lectures : - Thermodynamic energy equation, - Change in temperature when raising and lowering the air, - Simple convection . 5. Contents 5. Lectures : - Static stability of the air layer, - Examples of very stable layers, - Convective atmosphere stability . 6. Contents 6. Lectures : - Cloud formation , - Cloud forms and clasification, - Fog, - Precipitation, - Storms . 7. Contents 7 . lectures : - Scalar fields, - Isogonals and gradient, - Advection, - Equation of motion and forces, - Stationary winds in heights . 8. Contents 8. Lectures : - Impact of friction on stationary winds, - Ground layer and turbulence, - Time fronts . 9. Content of the lecture : - Local winds, - Continuity equation, - Solar and terrestrial radiation . 10. Contents 10. Lectures : - Passage of radiation through the atmosphere and scattering, - Solar energy at the ground . 11. Contents 11. Lectures : - Earth's equilibrium temperature and greenhouse effect, - Climate change and global warming. 12. Contents 12. Lectures : - Global circulation . 13. Contents 13. Lectures : - Numerical weather forecast . 14. Contents 14. Lectures : - hazards in flight. 15. Contents 15. Lectures : - 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: 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 Kompetence: 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.	Objectives : 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 Competencies: 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: Z1: Razumevanje procesov v ozračju in postopka pripave vremenskih napovedi, razumevaje različnih vremenjskih stanj in pravilno tolmačenje vremenskih podatkov in napovedi. Spretnosti: S1.1 Sposobnost vrednotenja in razumevanja vremenskih podatkov ter napovedi in pravilno ukrepanje na osnovi the podatkov in napovedi. S1.2 Izvajanje kompleksnih operativno-strokovnih opravil, ki vključujejo tudi uporabo metodoloških orodij. S1.3 Obvladovanje zahtevnih, kompleksnih delovnih procesov ob samostojni uporabi znanja v novih delovnih situacijah. S1.4 Diagnosticiranje in reševanje problemov v različnih specifičnih delovnih okoljih, povezanih s področjem izobraževanja in usposabljanja. S1.5 Osnova za izvirna dognanja/ stvaritve in kritično refleksijo.	Knowledge: 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 . Skills: S1.1 Ability to evaluate and understand weather data and forecasts and to act on the basis of these data and forecasts . S1.2 Executing complex operationa-professional tasks that incorporate usage of methodological tools. S1.3 Mastering demanding and complex work processes by independent usage of knowledge in new working situations. S1.4 Problem diagnostics and solving in different and specific working environments that are linked to the teaching and training content. 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 Obravnava snovi po urejeni in vnaprej razloženi sistematiki. P3 Avditorne vaje, kjer se teoretično znanje s predavanj podkrepi z računskimi primeri. P6 Interaktivna predavanja P7 Študij literature in razprava P8 Izdelava in predstavitev aplikativnih seminarskih nalog	P2 Presenting the content according to the explained system. P3 Auditorial exrecises, in which theoretical content from the lectures is supplemented with practical examples. P6 Interactive lectures. P7 Literature study and discussion. 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.