NYÍREGYHÁZI EGYETEM
Műszaki és Agrártudományi Intézet
Közlekedéstudományi és Infotechnológiai Intézeti Tanszék

Course: **Theory of Flight I.**
Year 2023/2024, semester I
Professional Pilot class I.
Code: BHR1019

COURSE PLAN

Number of weeks of the course: 14
Lecture: 4 hours weekly, 56 hours/semester
Lecturer: Rozgonyi László

Credit: 4
Practice: 1 hour weekly, 14 hours/semester
Practical instructor.: Rozgonyi László

Testing method: colloquium

Number of written tests:	3	**Date of which:**	weeks 40, 44, 49
Number of Coursework:	1	**Deadline of which:**	week 48

Mandatory and Recommended Literature

- Rozgonyi László: Principles of Flight Aviationexam 2019
- Piper Pa-28, Cessna 152 POH, Airbus A320 FCOM
- Pázmány László: Light Aeroplane Design 1963
- Michael V. Cook: Flight Dynamics Principles 2007

Course completion requirements are as follows:

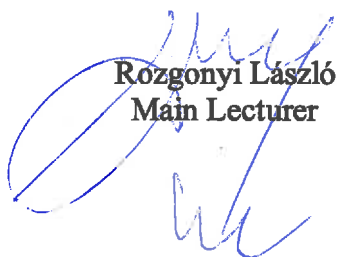The trainees are evaluated according to the following system:

The presence on the lectures must be active, disciplined and according to the Educational and Examination Guidelines.
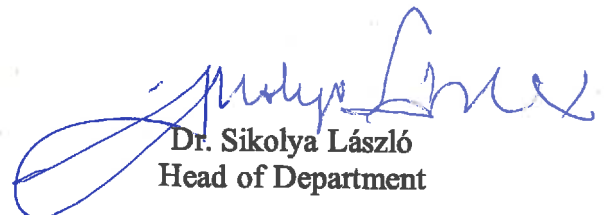
Test 1:	12 p
Test 2:	12 p
Test 3:	12 p
Coursework:	10 p
Lesson activity:	4 p
Colloquium:	50 p
Total:	100 p

It is mandatory to reach 51% at each subpart to reach a satisfactory grade.

Nyíregyháza, 2023. august 25.

Rozgonyi László
Main Lecturer

Dr. Sikolya László
Head of Department

Week nr.	Lecture Subject	Nr. of hours	Practice Subject	Nr. of hours
36.	Basics of Physics and Mathematics inc. basics of multivariable calculus. Definitions of Flow.	4	Presentation of Courseweork	1
37.	Characteristics of Aeroplane Wings, Structure. 2D Flow, Bernoulli-thorem, Law of Continuity, Momentum Theorem. Joukowski theorem.	8	Calculations with Bernoulli-thorem, Law of Continuity.	2
38.	Forces in 2D Flow, characteristic curves and coefficients. Viscosity, similarity numbers.	12	Reynolds number calculations.	3
39.	3D Flow properties, vortex system of the aircraft, induced drag and coefficients.	16	Induced drag, wing tip vortex magnitude calculations	4
40.	Ground effect. Thrust Required and Power Required curves. Leading Edge and Trailing Edge Devices.	20	Test 1.	5
41.	Thrust and Power Available introduction, basics of jet engines and propellers.	24	Analysis of Piper Pa28/Cessna 152 and Airbus A320 performance curves.	6
42.	Momentum theorem and blade element theorem of propellers. Advance ratio, secondary effects.	28	Propulsive efficiency calculations	7
43.	Pénaud -diagramme. Basics of Flight Mechanics.	32	Basic calculations.	8
44.	Forces and characteristic speeds in Takeoff, Climb, Cruise, Descent, Glide, Landing segments	36	Test 2	9
45.	Stability and Equilibrium. Definitions and basics categorisation. Static Longitudinal Stability and Equilibrium intro. Damping Moments	40	Coursework guidance I.	10
46.	Static Longitudinal Stability, Equilibrium. Neutral Point. Centre of Gravity Limits.	44	Stability computations.	11
47.	Stick position and stick force gradients. Static Lateral Stability.	48	Coursework guidance II.	12
48.	Static Directional Stability and Dynamic Directional-Lateral Stabilities.	52	Coursework guidance III.	13
49.	Test 3	56	Test 3.	14