1. Subject name	**Advanced theory of flight II. Flight mechanics, flight dynamics and control**				
2. Subject name in Hungarian	Advanced theory of flight II. Flight mechanics, flight dynamics and control				
3. Code	**BMEKOVRD003**	4. Evaluation type	exam grade	5. Credits	**4**
6. Weekly contact hours	**2 (0) Lecture**	**2 (0) Practice**		**0 (0) Lab**	
7. Curriculum	**PhD Programme**	8. Role	**Basic course**		

9. Working hours for fulfilling the requirements of the subject					**120**
Contact hours	56	Preparation for seminars	20	Homework	10
Reading written materials	10	Midterm preparation	0	Exam preparation	24

10. Department	**Department of Aeronautics and Naval Architectures**
11. Responsible lecturer	Dr. Rohács József
12. Lecturers	Dr. Rohács József
13. Prerequisites	

14. Description of lectures

C.) Flight mechanics. Required and available thrust / power. Take-off and landing. Cruise flight. Descent. Range and endurance. Flight performance. Flight and load envelops. Energetic approach in trajectory optimisation. Stability and controllability. Static longitudinal flights.

D.) Flight dynamics and control. System of equation of motion. Longitudinal and lateral motion. Effects of manoeuvres and gusts. Dynamic stability. Controllability. Supermanoeuvrability. Thrust vectored control. Bifurcation analysis. Chaos in aircraft dynamics. Control of flexible bodies. Load management. Flight simulations. Calculation and estimation of the aerodynamic coefficient from the in-flight measurements. Automatic control. New control methods: adaptive, reconfigurable methods, methods based on the biological principles, formation flights, etc. Autonomous systems. Flight of UAV, drones. Pilot in loop. Less skilled pilots. Pilot subjective decisions.

15. Description of practices

PhD student have not studied the flight mechanics, flight dynamics and control earlier must perform a homework, namely calcualtion or simulation studies of flight performance stability and controllability of an aircraft; systematic consultancy on a special project and working individually on proposal or contribution an article.

16. Description of labortory practices

As it required for performing the practical works.

17. Learning outcomes

A. Knowledge

Increasing knowledge in flight mechanics, flight dynamics and control; developing the competence in understanding, measuring, calculation, simulation and predicting the flight performance, characteristics of flight dynamics, stability and aircraft controllability.

B. Skills C. Attitudes D. Autonomy and Responsibility

18. Requirements, way to determine a grade (obtain a signature)

19. Opportunity for repeat/retake and delayed completion

20. Learning materials

Effective date	27 November 2019	This Subject Datasheet is valid for	Inactive courses