1. Subject name	**Ship motions**				
2. Subject name in Hungarian	Hajók dinamikája				
3. Code	**BMEKOVRM624**	**4. Evaluation type**	**exam grade**	**5. Credits**	**4**
6. Weekly contact hours	**2 (11) Lecture**	**1 (5) Practice**	**1 (5) Lab**		
7. Curriculum	**Vehicle Engineering MSc (J)**	**8. Role**	**Specialization (sp) at Vehicle Engineering MSc (J)**		
9. Working hours for fulfilling the requirements of the subject					**120**
Contact hours	56	**Preparation for seminars**	15	**Homework**	15
Reading written materials	19	**Midterm preparation**	0	**Exam preparation**	15
10. Department	**Department of Aeronautics and Naval Architectures**				
11. Responsible lecturer	Dr. Hargitai L. Csaba				
12. Lecturers	Dr. Hargitai Csaba				
13. Prerequisites					

14. Description of lectures

Coordinate systems of ships and their relationship. Motion equations of ships based on Newtonian mechanics. The theory of maneuver, the theory of seakeeping. Concept and calculation of added masses. Methods for representation of forces acting on the hull in motion equations. Elemental maneuvers with motion equations. Basics of wave equations, wave spectra. Dynamics of propulsion system.

15. Description of practices

Students are practicing different ship dynamics calculations.

16. Description of labortory practices

In laboratory practice, students use a computer program to calculate the seakeeping properties of a ship and analyze the results.

17. Learning outcomes

A. Knowledge

- Knows and understand the coordinate systems that are used to describe ship motions and their relationships.
- She/he is familiar with the motion equations of ships based on Newtonian mechanics.
- She/he knows the concept of added masses and basic methods of calculation.
- She/ he knows the elementary oscillations of ships and their calculations with motion equations.
- Based on the linear maneuver theory, she/he knows how to calculate elementary maneuvers with motion equations.
- She /he knows the basics of wave equations and wave spectra. Knows the principles and structure of roll stabilisation systems used on ships.

B. Skills

- She/he can perform seakeeping tests using a computer program.
- She/he can estimate the expected maneuverability characteristics of a ship.
- She/he can calculate the propulsion system dynamics.

C. Attitudes

- Interested, responsive, independent, take care for the deadlines.

D. Autonomy and Responsibility

- Pro-activity in professional work, the self-standing selection of the relevant solution methods.
- Making decision circumspectly.

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

Mid-term requirement: preparing 1 semestrial home work
Final grade: 1 exam (measuring the theoretical knowledge), 1 semestrial home work, the final grade is the average of the parts

19. Opportunity for repeat/retake and delayed completion

second exam and delayed submission of the homework

20. Learning materials

Dr. Kovács A.-Dr. Benedek Z.: A hajók elmélete
Komm F.: Hajók kézikönyv
Hargitai Cs.: Hajók dinamikája
J. Brix: Manoeuvring Technical Manual
E. Trupper: Basic ship theory
E. Lewis: Principles of naval architectures

Effective date	10 October 2019	**This Subject Datasheet is valid for**	Inactive courses