

**SUBJECT DATA SHEET AND REQUIREMENTS**last modified: 11st October 2019**FLUID MACHINERY****(ÁRAMLÁSTECHNIKAI GÉPEK)**

1	Code	Semester Nr. or fall/spring	Contact hours/week (lect.+semin.+lab.)	Requirements p / e / s	Credit	Language
	BMEGEVGBX01	s	2+1+1	e	4	English

2. Subject's responsible:

Name:	Position:	Affiliation (Department):
Csaba Hős, PhD	Associate professor	Dept. of Hydrodynamic Systems

3. Lecturer:

Name:	Position:	Affiliation (Department):
Csaba Hős, PhD	Associate professor	Dept. of Hydrodynamic Systems
Lászó Kullmann, PhD	Ret. associate professor	Dept. of Hydrodynamic Systems
Péter Csizmadia, PhD	contact lecturer	Dept. of Hydrodynamic Systems

4. Thematic background of the subject:

The course covers the basic knowledge in turbomachines (pumps, fans, blowers, compressors) and compression/pumping systems.

5. Compulsory / recommended prerequisites:

Compulsory: Engineering Thermodynamics
 Fluid Mechanics

Suggested: -

6. Main aims and objectives, learning outcomes of the subject:

Upon finishing the course, the students will be able to design simple pumping systems, to select pumps and to complete simple pipe and valve sizing tasks. Moreover, they will become familiar with the operation and maintenance of such systems (e.g. head loss, cavitation, water hammer).

7. Method of education:

- lecture: 2h/w
- seminar: 2h/2 weeks
- laboratory: 2h/2 weeks
- homework: measurement report submission

8. Detailed thematic description of the subject (by topic, min. 800 character):

Euler equation, specific work, head, performance characteristics of axial and centrifugal machines. Losses, efficiencies. Non-dimensional parameters, scaling laws, specific speed. Cavitation, NPSH. Operation (parallel, serial) and control of turbomachines. Thrust loads (axial, radial). Axial fan, axial compressor stage.

9. Requirements and grading

a) in term-period

- Attending all the measurements and submitting one measurement report.
- Attend minimum 70% of the classes.

b) in examination period

- Exam result >49%

c) Disciplinary Measures Against the Application of Unauthorized Means at Mid-Terms, Term-End Exams and Homework

According to the Code of Studies (Rector's Order № 7 of 2017 (6 November 2017) with the amendments of Rector's Order № 3 of 2018 (30 August 2018)), available at: https://gpk.bme.hu/downloads/en/BME_Code_of_Studies.pdf

d) grade

If the in-term requirements are accomplished, one can take the exam in the examination period. The final grade is based only on the exam score as shown in the table below.

grade • [ECTS]	points
jeles(5) • Excellent [5]	above 88%
jó(4) • Good [4]	76–88%
közepes(3) • Satisfactory [3]	62–76%
elégséges(2) • Pass [2]	50–62%
elégtelen(1) • Fail [1]	under 50%

10. Retake and repeat

- Only two laboratory measurements can be retaken.
- The exams can be retaken according to the Code of Studies.

11. Consulting opportunities:

- Consultation hours: by email appointments

12. Reference literature (compulsory, recommended):

- Dixon: Fluid Mechanics and Thermodynamics of Turbomachinery, Butterworth, ISBN 0-7506-7059-2

- A. Nourbakhsh *et al.*: Turbopumps & Pumping Systems, Springer, ISBN 978-3-540-25129-3
- Lecture notes
- Downloadable materials: www.hds.bme.hu

13. Home study required to pass the subject:

Contact hours	56	h/semester
Home study for the courses	28	h/semester
Home study for the mid-semester checks	0	h/check
Preparation of mid-semester homework	8	h/homework
Home study of the allotted written notes	14	h/semester
Home study for the exam	14	h/semester
Totally:	=30×4=120	h/semester

14. The data sheet and the requirements are prepared by:

Name:	Title:	Affiliation (Department):
Csaba Hős, PhD	Associate professor	Dept. of Hydrodynamic Systems

15. Contact person for administrative questions:

Péter Csizmadia, PhD, pcsizmadia@hds.bme.hu