SUBJECT DATA SHEET AND REQUIREMENTS

last modified: 20th May 2016

ACOUSTICS II. (PhD)

AKUSZTIKA II. (PhD)

1	Code	Semester Nr. or fall/spring	Contact hours/week (lect.+semin.+lab.)	Requirements p / e / s	Credit	Language
	BMEGEÁT4A24	1.(2.*) fall/spring	2+0+0	e	3	English

*: in case of enrolment in fall

2. Subject's responsible:

Name:	Title:	Affiliation (Department):
Dr. Gergely KRISTÓF	associate professor	Dept. of Fluid Mechanics

3. Lecturer:

Name:	Title:	Affiliation (Department):
Dr. Csaba HORVÁTH	assistant professor	Dept. of Fluid Mechanics

4. Thematic background of the subject:
physics, fluid dynamics, acoustics

5. Compulsory / suggested prerequisites:
Compulsory: -
Suggested: Technical Acoustics and Noise Control (BSc and/or MSc level)

6. Main aims and objectives, learning outcomes of the subject:
The course aims to introduce students to the PhD-level areas of acoustics, according to the individual doctoral research topic and interest, with respect to the following (ch.8.) thematic description, in consultation with the lecturer.

7. Method of education:
lecture 2h/w, and private consultation

8. Detailed thematic description of the subject:
Review of the governing equations, with regard to the special forms used in acoustics.
Free field acoustics for a fluid medium at rest: orders of magnitude, wave equation and noise sources, Green function and integral forms.
The inverse problem and the uniqueness of the source.
The basic solutions of the wave equation.
Acoustic energy and impedance.
Free field Green's functions.
Multipole decomposition.
Doppler effect.
Aeroacoustic analogies. Lighthill analogy, Curle's analogy, Ffowcs Williams-Hawkings method, choice of aeroacoustic variable, vortex noise.
Categorization of aeroacoustic problems.

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The hierarchy of numerical aeroacoustic simulations: direct computation of sound, hybrid methods, large eddy simulations.
Numerical considerations: Spatial discretization (wave propagation characteristics of finite difference schemes, dispersion and dissipation, spurious waves, artificial viscosity, and filtering, computational efficiency), temporal discretization, boundary conditions.

9. Requirements and grading
a) in term-period
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b) in examination period
Written and/or oral exam. Totally max. achievable 100 scores equal to 100% as base of the final grading. Minimum 40 %.
Grading: 0%-39%: fail(1); 40%-54% pass(2), 55%-69%: satisfactory (3), 70%-84%: good(4), 85%-100%: excellent (5)

c) The students are subject to disciplinary measures against the application of unauthorized means at mid-terms, term-end exams and homework and the application of the 1/2013. (I.30.) Dean's Order must be followed.

10. Retake and repeat
Due to the Code of Studies and Exams of BME. Any further movements are due to the Code of Studies and Exams of BME.

11. Consulting opportunities:
Consultation hours: by email appointments and as it is indicated on the department's website.

12. Reference literature (compulsory, recommended):

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- Downloadable materials: www.ara.bme.hu/oktatas/tantargy/NEPTUN/BMEGEAT4A24

13. Home study required to pass the subject:

Contact hours	28	h/semester
Home study for the courses	28	h/semester
Home study for the mid-semester checks	-	h/check
Preparation of mid-semester homework	-	h/homework
Home study of the allotted written notes	20	h/semester
Home study for the exam	28	h/semester
Totally:	90	h/semester

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

Name:	Title:	Affiliation (Department):
Dr. Csaba HORVÁTH	assistant professor	Dept. of Fluid Mechanics