Tantárgy adatlap és követelményrendszer | Subject data sheet and requirements

2009.01.05.

Budapesti Műszaki és Gazdaságtudományi Egyetem
Gépészmérnöki Kar
Áramlástan Tanszék
Mechanical Engineering Modelling (MSc)
Fluid Mechanics major (MSc)

Budapest University of Technology and Economics
Faculty of Mechanical Engineering
Department of Fluid Mechanics
Mechanical Engineering Modelling (MSc)
Fluid Mechanics major (MSc)

Flow Measurements
(Áramlástani méréstechnika)

1.	*Code (kód)*	*Semester (szemeszter)*	*Requirements (követelmények)*	*Credit (kredit)*	*Language (nyelv)*
	BMEGEÁTMW03	1.	lect./sem./lab. (**e**xam / **p**ract. / **s**ignat.) 2/1/1 (p)	5	English

2. Responsible person and Department (Tantárgyfelelős személy és Tanszék):

Name (Név):	*Status (Beosztás):*	*Department (Tanszék):*
Dr. János VAD	associate professor	Dept. Fluid Mechanics

3. Lecturer (Tantárgy előadó(k)):

Name (Név):	*Status (Beosztás):*	*Department (Tanszék):*
Dr. János VAD	associate professor	Dept. Fluid Mechanics
Jenő Miklós SUDA	assistant professor	Dept. Fluid Mechanics
Márton BALCZÓ	research assistant	Dept. Fluid Mechanics

4. Thematic background of the subject (A tantárgy az alábbi témakörök ismeretére épít):

Fundamentals of Fluid Mechanics

5. Compulsory / suggested pre-requisites (Kötelező/ajánlott előtanulmányi rend):

	Subject name (tárgynév)	*Code (tárgykód)*
Compulsory pre-requisites:	-	-
Suggested pre-requisites:	Fluid Mechanics	BMEGEÁTAG01 or BMEGEÁTAE01 or BMEGEÁTAM01 or BMEGEÁTAT01 or BMEGEÁTMF03

6. Main objectives of the subject (A tantárgy célkitűzései):

Getting acquainted with the measurement principles, application areas, advantages and limitations of various flow measuring techniques applied in industrial practice as well as in R&D related laboratory activities.

7. Detailed thematic description of the subject (A tantárgy részletes tematikája):

Practical / industrial aspects of flow measurements.

Measurement of temporal mean pressures: static, total, dynamic.

Probes and methods.

Manometers.

Pressure-based measurement of velocity magnitude and direction.

Anemometers, thermal probes.

Measurement of unsteady pressures.

Temperature measurements.

Hot wire anemometry.

Laser optical flow diagnostics: Laser Doppler Anemometry (LDA), Phase Doppler Anemometry (PDA), Particle Image Velocimetry (PIV).)

Flow visualization.

Flow rate measurements with use of contraction elements and deduced from velocity data. Comparison.

Flowmeters: ultrasonic, MHD, capacitive cross-correlation technique, Coriolis, vortex, rotameter, turbine, volumetric.

Industrial case studies.

Collaboration of measurement technique and computational simulation.

Laboratory exercise.

8. Mode of education of the subject (A tantárgy oktatásának módja):

Presentations; interactive problem solving (excercises); laboratory demonstrations and measurements.

9. Requirements (Követelmények):

Two written mid-term tests, incorporating solution of practical problems - maximum achievable scores: 2 × 35 = 70 scores. Laboratory report - maximum achievable scores: 30 scores. Total: 100 scores. Pre-requisite for achievement of the subject: min. 40 % obtained out of the part-scores.

10. Consulting opportunities (Konzultációs lehetőségek):

1 hours / week, upon agreement with the lecturer.

11. Reference literature (Jegyzet, tankönyv, felhasználható irodalom):

– Website of the subject: http://www.ara.bme.hu/oktatas/tantargy/NEPTUN/BMEGEATMW03

Vad, J. (2008), *Advanced flow measurements.* Műegyetemi Kiadó, 45085. ISBN 978 963 420 951 5.

12. Home study required to pass the subject (A tantárgy elvégzéséhez szükséges tanulmányi munka):

3 hours / week.

13. The data sheet and the requirements are prepared by (A tantárgy tematikáját kidolgozta):

Budapest, 5th of January 2009

Name (Név):	*Status (Beosztás):*	*Department (Tanszék):*
Dr. János VAD	associate professor	Dept. Fluid Mechanics