

SUBJECT DATA SHEET AND REQUIREMENTS

Last modified: 2013.09.20.

Valid from: 2013-2014-II. semester

ADVANCED FLUID MECHANICS AZ ÁRAMLÁSTAN VÁLOGATOTT FEJEZETEI

1.	Code	Semester Nr. or fall/spring	Contact hours / week (lect.+semin.+lab.)	Requirements p / e / s	Credit	Language
	BMEGEÁTMW01	spring	3+0+0	e	4	English

2. Subject's responsible:

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

3. Lecturer:

Name:	Title:	Affiliation (Department):	%
Dr. Kristóf Gergely	associate professor	Dept. Fluid Mechanics	100 %
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4. Thematic background of the subject:

fluid mechanics

5. Compulsory / suggested prerequisites:

Compulsory: Fluid mechanics (BSc level)

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

To introduce physical phenomena occurring in various flow categories of technical relevance.

To deliver practical knowledge in analyzing flow phenomena.



7. Method of education:

lecture 3 h/w, seminar 0 h/w, laboratory 0 h/w

Illustrative problems are solved and discussed in lecture time.

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

1. Overview of the fundamentals of fluid mechanics. Vorticity transport equation.
2. Potential flows, solution methods based on analytical solutions.
3. Percolation, Darcy flow. Wells.
4. Boundary layers. Similarity solutions for laminar and turbulent boundary layers.
5. Transition. Turbulent boundary layers. BL control.
6. Overview of computational fluid dynamics (CFD). Turbulence models.
7. Fundamentals of gas dynamics. Wave phenomena. ISENTROPIC flow.
8. Normal shock waves.
9. Oblique shock waves, wave reflection. Prandtl-Meyer expansion, Supersonic jets.
10. Atmospheric flows.
11. Aerosols.
12. Aeroacoustics.
13. Pipe networks.
14. Case studies.

Ratio (%) of the application-level and practical knowledge gained in course of the subject: 60 %

9. Requirements and grading:

The subject is concluded with examination which consists of solution of practical problems, which has been discussed in lecture time, and answering essay questions about the theoretical topics. Evaluation of marks (1,2,3,4,5) is according to the usual lower limits (0,40,70,85). The list of theoretical questions is available on the web page of the course. The subject involves no midterm tests.

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

Supplement to 1/2013. (I.30.) Dean's Order / Codicil /: The following students are subject to disciplinary measures.

- (a) *Those students who apply unauthorized means (book, lecture notes, etc.), different from those listed in the course requirements and/or adopted by the lecturer in charge of the course assessment, in the written mid-term exams taken, and/or *invite/accept any assistance of fellow students, with the exception of borrowing authorized means, will be disqualified from taking further mid-term exams in the very semester as a consequence of their action. Further to this, all of their results gained in the very semester will be void, can get no term-end signatures, and will have no access to Late Submission option. Final term-end results in courses with practical mark will automatically become Fail (1), the ones with exam requirements will be labelled Refused Admission to Exams.
- (b) *Those students whose homework verifiably proves to be of foreign extraction, or alternatively, evident results or work of a third party, are referred to as their own, will be disqualified from taking further assessment sessions in the very semester as a consequence of their action. Further to this, all of their results gained in the very semester will be void, can get no term-end signatures, and will have no access to Late Submission options. Final term-end results in courses with practical mark will automatically become Fail (1), ones with exam requirements will be labelled Refused Admission to Exams.
- (c) *Those students who apply unauthorized means (books, lecture notes, etc.), different from those listed in the course requirements and/or adopted by the lecturer in charge of the course assessment, in the written term-end exams taken, and/or *invite/accept any assistance of fellow students, with the exception of borrowing authorized means, will immediately be disqualified from taking the term-end exam any further as a consequence of their action, and will be inhibited with an automatic Fail (1) in the exam. No further options to sit for the same exam can be accessed in the very same exam period.
- (d) *Those students who alter, or make an attempt to alter the already corrected, evaluated, and distributed test or exercise/problem,
 - i.) as a consequence of their action, will be disqualified from further assessments in the respective semester. Further to this, all of their results gained in the very semester will be void, can get no term-end signatures, and will have no access to Late Submission options. Final term-end results in courses with practical mark will automatically become Fail (1), the ones with exam requirements will be labelled Refused Admission to Exams;
 - ii.) and will immediately be inhibited with an automatic Fail (1) in the exam. No further options to sit for the same exam can be accessed in the very same exam period.

11. Consulting opportunities:

- According to the consultation times indicated on the web page of the lecturer of the subject.
- On cases-by-case arrangement.
- One day before each exam (if relevant to the subject).

12. Reference literature (compulsory, recommended):

- Self-made lecture notes taken during the lectures are sufficient and the recommend source of information to the preparation for the midterm tests. Lecture notes in PowerPoint format can also be downloaded from the web page of the subject.
- The web page of the subject can be found on the web page of the Department of Fluid Mechanics or by entering the following URL: <http://www.ara.bme.hu/oktatas/tantargy/NEPTUN/BMEGEATMW01>

13. Home study required to pass the subject:

Contact hours	42	h/semester
Home study for the courses	0	h/semester
Home study for the mid-semester checks	0	h/check
Preparation of mid-semester homework	0	h/homework
Home study of the allotted written notes	0	h/semester
Home study for the exam	28	h/semester
Altogether:	70	h/semester

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

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