SYLLABUS

1. Course title:

THERMAL-FLUID EXPERIMENT

2. Code:

3. Cycle of study:

I

4. ECTS credits:

3

5. Type of course:

Elective

6. Prerequisites:

None

7. Class restrictions:

None

8. Duration / semester(s):

1 VII

9. Weekly contact hours and student workload:

	Semester (1)	Semester (2)	(for two-semester courses)	Workload: (hours)	
	VIII				
9.1. Lectures	3			Classes:	33,75
9.2. Seminars	0			Individual work:	46,83
9.3. Laboratory / Practice classes	0			In total:	80,58

10. Faculty:

Faculty of Mechanical Engineering

11. Department/study program:

Energetics and Thermal-fluid engineering

12. Lecturer:

PhD, Fikret Alić, Full Professor

13. Course aims:

Acquisition of theoretical knowledge and practical skills in the analysis, description and modeling of thermofluid phenomena and processes. After successfully completing the course, the student will be able to:
- scientifically approach experiments in thermal-fluid technology;

-compare the results of theory and experiment;
-choose experimental methods;
- plan experiments;
- evaluate measurement data;
- apply computers in data collection and processing;
- evaluate measurement uncertainties.

14. Learning outcomes:

They define different types of systems and processes, perform model classification, set the appropriate model for the observed system, analyze the given model, use methods for solving the dynamics of models of complex energy systems, use numerical methods for solving systems of nonlinear differential equations. Solving technical problems of regulation of thermo-hydraulic processes as dynamic systems with distributed parameters.

15. Course content:

1. Introduction. Systems and processes. Process modeling.
2. Analytical and numerical modeling.
3. Measurement of thermo-fluid quantities. Indirect determination of process sizes.
4. Getting to know the experimental approach to scientific research and development of components for thermo-fluid technique.
5. Connection between theory and practice. Experimental methods in research and development.
6. Setting up the experiment and selecting the measurement method and evaluation of the results.
7. Knowledge test.
8. Display of measurement results and determination of measurement uncertainty.
9. Optimization parameters and optimization of the thermal-fluid process.
10. Establishing a thermal-fluid experiment.
11. Thermal-fluid experiments-motionless and fluid flow.
12. Thermal-fluid experiment-phase change. Experimental modeling.
13. Thermal-fluid experiment - complex thermal-fluid device.
14. New knowledge and solutions resulting from experimental research and their application.
15. Knowledge test.

16. Learning methods:

The following methods will be used in the course of the course in order to effectively conduct classes and achieve the set objectives of the course and student competencies:
• lectures with the use of multimedia tools with active participation and discussions of students,
• presentation in a real environment.

17. Assessment methods:

The concept of knowledge assessment is based on continuous work with students throughout the semester. Knowledge assessment methods include: assessment of both individual and group activities during the semester, preparation of a seminar paper, and final knowledge assessment in written and/or oral form. This ensures equal treatment (written and/or oral knowledge assessment) for all students with different affinities.

Grade	described	by letter	points
5 (five)	Does not meet minimum criteria	F;FX	<54
6 (six)	meets the minimum criteria	E	54 -64
7 (seven)	Generally good, but with significant flaws	D	65-74
8 (eight)	Average, with noticeable errors	C	75-84
9 (nine)	Above average, with some errors	B	85-94
10 (ten)	Exceptional success without mistakes or with minor mistakes	A	95-100

18. Assessment components:

The exam grade is based on the total number of points that the student has earned by completing the pre-exam requirements and taking the exam and contains a maximum of 100 points, according to the following scale
Student obligations
Points
Lecture attendance 5
Test I 25
Test II 25
Total pre-exam requirements 55
Final exam 25 - 45

19. Mandatory reading list:

1. Kecman V., (1988) Dinamika procesa, Zagreb, Liber
2.M.A. Plint, L.Borswirth, (1978) Fluid Mechanic, a laboratory course, Charles Griffin and CO Ltd, London.
3. V.A. Grigorjeva; V.M. Zorina, (1982). Termotehnički pokus u prijenosu topline i tvari, Energizdat, Moskva

20. Additional reading list:

21. Web sources:

22. Applicable from the academic year:

23. Adopted in the Faculty/Academy session: