

SUBJECT CARD FOR RECRUITMENT 2022-2023

GENERAL INFORMATION

1. Name of subject	Computational Fluid Dynamics
2. Name of the course of study	Mechanics and Mechanical Engineering
3. Level of study	Full-time First Degree Studies
4. Number of ECTS credits	1
5. Number of hours per semester	

semester	lect.	excer.	lab.	prj.	zp.	works.
V			15			

6. Language	english
7. Lecturers	Michał Biały, m.sc. eng.,

DETAILS

8. Prerequisites
1. Course in fluid mechanics.
9. Objectives
C1 Familiarising students with the basics of computer fluid mechanics.
C2 The introduction of basic knowledge on the issues of grid adaptation to the fluid mechanics problem under consideration, grid preparation and its impact on the quality of calculations.
C3 The introduction students with the principles of conducting and developing the results of numerical calculations..
10. The introduction students with the principles of conducting and developing the results of numerical calculations.

A student who has passed the subject:	reference to directional learning outcomes
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KNOWLEDGE

EU01	It has advanced knowledge in designing technological processes of machine elements using computer techniques.	K_W15
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SKILLS

EU02	Can apply thermodynamics to describe physical phenomena and mathematical modelling of heat exchange in technological processes	K_U21
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SOCIAL COMPETENCE

EU03	Understands the need for continuous learning (e.g. second cycle studies, postgraduate studies, literature studies); can encourage and organise further training for others..	K_K01
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11. Programme of lecture	
Form of classes - lecture	
Laboratorium:	
<ol style="list-style-type: none"> 1) Introduction to CFDs. 2) Preparation of geometry for simulation. 3) Numerical Grid in CFD analyses. 4) Finite Element Method. 5) Methodology of conducting simulation - stages of analysis - analysis settings, boundary conditions, etc.. 6) Post-processing - analysis of the results obtained, critical assessment of their credibility. 	
12. Teaching tools/methods	
1. Lecture with multimedia presentations.	
2. Computer workstations.	
3. Consultation.	
13. Assessment methods (forming; summary)	
1. Discussion during lectures.	
2. Final grade with based on solving the problem using CFD software.	
14. Student workload	
Form of activity	number of hours
1. Classes with direct participation of the teacher and consultations	25
2. Student workload	5
total	25
summary number of ECTS points	1
15. Basic and supplementary literature	
Basic literature::	
1. Podstawy mechaniki płynów i hydrauliki / Romuald Puzyrewski, Jerzy Sawicki. Wydanie 3 poprawione - 1 dodruk. - Warszawa : Wydawnictwo Naukowe PWN, 2000	
2. Iteracyjne rozwiązywanie zadań z mechaniki płynów / Piotr Gorzelańczyk, Jan Adam Kołodziej. Piła : Państwowa Wyższa Szkoła Zawodowa im. Stanisława Staszica w Pile, 2007	
Supplementary literature:	
1. Munson B., Fundamentals of Fluid Mechanics, Wiley	
2. Mateusz Pawłucki, Maciej Kryś. CFD dla inżynierów. Praktyczne ćwiczenia na przykładzie systemu ANSYS Fluent. Wydawnictwo: mHelion.	
16. Forms of assessment - details	
<p>Conditions for obtaining a pass in the lecture: the classes end with a grade. Elements of the semester grade: 90% are the student's knowledge and skills, 10% are social competences / student base.</p> <p><u>A method of verifying learning effects in terms of knowledge and skills:</u></p> <p>The pass: grade from a correctly solved flow (fluid mechanics) problem using CFD software:</p> <p>Percentage grading scale: 91% - 100% = 5,0</p> <p>81% - 90% = 4,5</p> <p>71% - 80% = 4,0</p> <p>61% - 70% = 3,5</p> <p>51% - 60% = 3,0</p> <p>0% - 50% = 2,0</p> <p>Absence on the classes is equivalent to no credit being obtained (2.0). In the case of absence or negative assessment, the student is obliged to pass the classes within the correctional period - set by the teacher.</p> <p><u>A method of verifying learning outcomes of social competence:</u></p> <p>Observation of student's engagement and work during the classes..</p>	

17. Other useful information on the subject matter	
1.	Direct information about the issues and programme content is provided by the tutor duringt he classes and during consultations.
2.	Classes will be take place in ABNS in Biała Podlaska.
3.	The classes will take place according to the current timetable.
4.	The consultations will take place in accordance with the timetable of the leader.