UNIVERSITETI /UNIVERSITY
"ISA BOLETINI"
MITROVICË

SYLLABUS – DESIGN OF MACHINE ELEMENTS I – MECHANICAL ENGINEERING		
Faculty:	Faculty of Mechanical Engineering and Computers	
Department	Mechanical Engineering	
Level	Bachelor	
Code of the Course	201ME	
Course	Design of Machine Elements I	
Course status	Mandatory	**Mandatory**, Elective
Semester	(III)	**Winter**/Summer
Nr.of hours per week	3+2	
ECTS	5	
Orari/Salla	Thursday, 8:30÷10:45, S305	
Academic Year	2024/2025	
Lecturer	Prof. Ass. Dr.sc. Fatmir Azemi	
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Course Description	The content of the Design of Machine Elements I subject typically includes an introduction to the principles and methods of machine design, including materials selection and properties, tolerances and tolerance fields, bearing capacity of machine parts, dynamic and static loads, and design of machine elements such as bearings, springs, and transmissions. The subject may also cover topics such as design of threaded connections, inseparable joints such as rivets and welds, and belt and chain transmitters. Assessment may include homework assignments, in-class tests, and a design project.
Purpose	The purpose of the Design of Machine Elements I subject is to provide students with an understanding of the principles and methods of machine design. Through the subject, students will learn how to calculate tolerances and loads for machine parts, design and analyze machine elements such as bearings, springs, and transmissions, and design threaded connections and inseparable joints. The subject aims to prepare students with the necessary engineering principles and skills to solve real-world design problems in the field of mechanical engineering.
Learning outcomes	By the end of this subject, students will be able to: ● Understand the principles and methods of machine design ● Calculate tolerances and loads for machine parts ● Design and analyze machine elements such as nuts, welding parts, springs, and pipes, ect ● Design threaded connections and inseparable joints ● Apply engineering principles to solve real-world design problems

Program	Weeks	Lecture
	First week:	Introduction to machine design ● Course overview and syllabus review ● Definition and scope of machine design ● Design process and factors affecting design ● Introduction to engineering standards and codes
	Second week:	Tolerances and Positioning of Tolerant Fields ● Definition and importance of tolerances in machine design ● Types of tolerances and their applications ● Positioning of tolerant fields and their effects on machine design
	***Third week*:**	Tolerances and Positioning of Tolerant Fields ● Definition and importance of tolerances in machine design ● Types of tolerances and their applications ● Positioning of tolerant fields and their effects on machine design
	Fourth week:	Numerical Exercises from Tolerances and Test Preparations ● Numerical exercises on tolerance design and analysis ● Practice tests on machine design concepts and calculations
	Fifth week:	Bearing Capacity of Machine Parts Loaded with Dynamic and Static Loads ● Review of stress and strain analysis ● Calculation of stresses in machine parts under static loads ● Calculation of stresses in machine parts under dynamic loads ● Introduction to fatigue failure and its prevention
	***Sixth week*:**	Bearing Capacity of Machine Parts Loaded with Dynamic and Static Loads ● Review of stress and strain analysis ● Calculation of stresses in machine parts under static loads ● Calculation of stresses in machine parts under dynamic loads ● Introduction to fatigue failure and its prevention
	Seventh week:	Machine Parts Connections (Thread Connections) ● Introduction to thread connections ● Movable and fixed threaded connections (bolts, nuts, screwdrivers) ● Loads and flows of fixed threaded connections ● Calculation of fixed threaded connections (bolted connections)
	Eighth week:	Machine Parts Connections (Thread Connections) ● Introduction to thread connections ● Movable and fixed threaded connections (bolts, nuts, screwdrivers) ● Loads and flows of fixed threaded connections ● Calculation of fixed threaded connections (bolted connections)

	***Ninth week**:*	Inseparable Joints (Rivet Joints) ● Introduction to inseparable joints ● Types of inseparable joints and their applications ● Design of riveted joints
	***Tenth week**:*	Inseparable Joints (Welded Joints) ● Design of welded joints
	***Eleventh week**:*	Springs, Pipes, and Pipe Fittings ● Introduction to springs and their applications ● Types of springs and their characteristics ● Basic features and application of pipes and pipe fittings ● Design of pipe fittings
	Twelfth week:	Classification and Division of Transmitters ● Introduction to transmitters ● Types of transmitters and their applications ● Classification and division of transmitters ● Selection and design of transmitters
	Thirteenth week:	Friction Transmitters ● Introduction to friction transmitters ● Design of friction transmitters ● Calculation of forces and stresses in friction transmitters
	Fourteenth week:	Belt Transmitters ● Introduction to belt transmitters and their applications ● Calculation of forces and stresses in belt transmitters
	Fifteenth week :	Chain Transmitters ● Introduction to chain transmitters and their applications ● Calculation of forces and stresses in chain transmitters ● Course evaluation and feedback

Literature	**Literature**
	Base literature Dr. sc. Nijazi Ibrahimi, Detalet e Makinave I dhe II_2, Prishtinë, 2004, Dr. sc. Hakif Zeqiri, Praktikum, ushtrimeve numerike, FIMK, Mitrovicë, 2015 Dr. sc. Azem Kyçyku, Udhëzime për detyra grafike, FIM, Prishtinë 2007 **Recommended Literature:** "Design of Machinery" by Robert Norton (6th edition, 2019) "Machine Elements in Mechanical Design" by Robert L. Mott, Edward M. Vavrek, Jyhwen Wang (2020)

	"Machine Design: An Integrated Approach" by Robert L. Norton and Keith Nisbett (6th edition, 2019) "Mechanical Design Engineering Handbook" by Peter R.N. Childs (3rd edition, 2018) "Mechanical Design: Theory and Methodology" by K. Srinivasan (2018) "Mechanical Design of Machine Elements and Machines: A Failure Prevention Perspective" by Jack Collins (2nd edition, 2018) Rolloff/Matek Maschinenelemente; Mechanical desktop.

Teaching methodology	Lecture-based instruction Hands-on design projects Use of computer-aided design (CAD) software Individual and group assignments Design project reports In-class tests Experimental work, etc.			
	Contribution to student workload (which should correspond to student learning outcomes - 1 ECTS credit = 25 hours)			
	Activity	**Hours**	**Days/weeks**	**Total**
	Lectures	3	15	45
	Exercise sessions (with TA)	2	15	30
	Practical work	2	3	6
	Office hours	1	5	5
	Fieldwork	0	0	0
	Midterms, seminars	2	3	6
	Homework	3	3	9
	Self-study	2	5	10
	Final exam preparation	2	3	6
	Time spent in exams	2	2	4
	Projects, presentations, etc	1	4	4
Total				**125**

Evaluati	**Assessment methodology:** Assignments: This involves assigning homework, problem sets, and design projects to students to test their understanding of the course materials and their ability to apply them in practical settings. Tests: Regular tests are conducted to evaluate the students' understanding of the course materials, their problem-solving skills, and their ability to apply theoretical concepts to practical problems. Class participation: Students are expected to actively participate in class discussions and activities, ask questions, and provide feedback to their peers and the instructor.

o n	Final project: A final project is typically assigned to students, which requires them to apply the knowledge and skills gained throughout the course to solve a practical design problem. Exams: There may be midterm and final exams that test the students' understanding of the entire course. (according to the Statute and Regulation for studies of UMIB)		
	Tests / Colloquia (First Test) (Second test) (Third test)	10 %; 10 %; 10%	
	Practical test during exercises (Essay)		
	Workshop seminar		
	Interpretation and presentation of artistic creativity and other works.		
	Assignments and courses during the semester		10 %
	Professional practice		10 %
	Other, Continuity		10 %
	Final exam		40 %
	Total		100%
	Final grade	Pikët (%)	Nota
		91 – 100	10
		81 - 90	9
		71 - 80	8
		61 - 70	7
		51 - 60	6

Academic policies	**Criteria for regular attendance and rules of etiquette during the organization of the lesson are set.** **Computer work:** Graphic works, I have to draw and write with a computer. In the works it is obligatory to respect the criteria for both the visual and the content aspect of the required works. **Ethics in teaching:** Graphic works should be personal works of each student. There will be no tolerance for copying, "borrowing" from the Internet or any other material. The same or similar works will have negative evaluations in the final evaluation of the student. **Time:** In agreement with the students, the deadlines for submitting works will be determined. There will be no tolerance for delays in the submission of works. Failure to arrive at the time when the assignment is explained does not justify the student for not submitting the paper. The deadline will be given earlier. If you are going to travel abroad, then you need to submit the paperwork in advance. The student has the right to request a consultation with the professor whenever he / she deems it reasonable and necessary for the performance of his / her work. **Rules of conduct and academic policies:** ● active participation of students in lectures o participation in discussion, comments and free expression of opinion, opinion and academic position (with arguments) ● Mandatory independent work and use of additional sources of information (various scientific websites, scientific journals, conference proceedings, etc.) ● Respecting lecture schedules without compromising academic freedom (silent cell phones) of respecting the word, thoughts and ideas of colleagues, ● It is not allowed to arrive late and leave without a valid reason from the lecture, test or exam o preparation and holding of relevant lectures, (obligation of the teacher). ● if the student is absent more than four times without reason in lectures and exercises, does not receive the signature for attendance. o the student cannot take the exam without an official document, ● if the student is dissatisfied with the grade obtained, has the right to complain in writing to the dean, within two working days after the announcement of the results, UMIB Statute o if the student does not follow the rules, in the exam uses tools that are not allowed, it is evaluated with a negative grade.

Mitrovicë
29/04/2023

Course Provider
Prof.ass.dr Fatmir Azemi

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