



UNIVERSITETI / UNIVERSITY
"ISA BOLETINI"
MITROVICË

Course Curriculum Model (Syllabus)		
Faculty:	FACULTY OF MECHANICAL AND COMPUTER ENGINEERING	
Department:	Mechanical Engineering and Economic Engineering	
Study Program	MSc in Manufacturing Technology and Management	
Level:	Master	
Code of the course:	114MTM	
Course:	Product Lifecycle Management & Sustainability	
Course Status:	Elective €	Mandatory/Elective
Semester:	II	Winter/Summer
Number of hours per week:	2+0	
ECTS:	5	
Time / location:	Monday, 9 ⁰⁰ -10 ³⁰ , K5	
Academic Year / Semester	2026/2027	
Language of Instruction:	Albanian (with flexibility in English)	
Lecturer:	Dr.sc. Kaltrina Kajtazi - Pacolli	
Assistant:		
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Telephone:		
Course Description	This course “Product Lifecycle Management and Sustainability” addresses modern concepts and practices of product lifecycle management (PLM), covering product design, development, production, usage, and end-of-life phases. Beyond the technical and technological aspects, the course emphasizes sustainability, circular economy principles, and the integration of the United Nations Sustainable Development Goals (SDGs). Students will gain the ability to understand the interrelation between product lifecycle management and its environmental, economic, and social impacts.	
Course Purpose / Course Goals	The aim of this course is to equip students with knowledge and skills to analyze, manage, and optimize product lifecycles while considering sustainability principles.	
Course Objectives	- To understand the principles and phases of the product lifecycle. - To develop the ability to apply methods of environmental impact assessment (e.g., LCA – Life Cycle Assessment). - To integrate sustainability and circular economy concepts into product lifecycle management. - To enable students to use digital tools for PLM implementation.	

Intended Learning Outcomes (ILOs)	Knowledge ● K1: Understands basic and advanced principles of PLM. ● K2: Explains life cycle assessment (LCA) methodologies. ● K3: Recognizes the link between innovation, digitalization, and sustainability in product management.
	Skills ● S1: Analyzes product lifecycle phases and managerial decision-making in each phase. ● S2: Applies modeling and optimization tools for lifecycle management. ● S3: Designs sustainable strategies for product management in different industries. Competences ● C1: Designs sustainable solutions for lifecycle management of products. ● C2: Integrates SDGs and sustainability principles into decision-making. ● C3: Collaborates in interdisciplinary teams for product management in industrial scenarios.

	Weeks	Lecture
Program	<i>First week</i>	Introduction to PLM and sustainability concepts
	<i>Second week</i>	Product concept and design phase
	<i>Third week</i>	Product development and prototyping
	<i>Fourth week</i>	Production and operations management
	<i>Fifth week</i>	Distribution and supply chain management
	<i>Sixth week</i>	Product use and support services
	<i>Seventh week</i>	Midterm Test (1st assessment)
	<i>Eighth week</i>	End-of-life management: recycling and reuse
	<i>Ninth week</i>	Life Cycle Assessment (LCA)
	<i>Tenth week</i>	Circular economy and green design
	<i>Eleventh week</i>	Digital technologies in PLM (IoT, Big Data, AI)
	<i>Twelfth week</i>	Sustainability and social impacts of products
	<i>Thirteenth week</i>	Case studies: International best practices
	<i>Fourteenth week</i>	Student Presentations
	<i>Fifteenth week</i>	Summary and final evaluation

Literature / Reading List:				
Literature	Main Literature: Stark, J. (2023). <i>Product Lifecycle Management: Digitalization of Product Lifecycle Processes</i> (ed. e pestë) Stark, J. (2022). <i>Product lifecycle management (Volume 1): 21st century paradigm for product realisation</i>. Springer Stark, J. (2024). <i>Product lifecycle management (Volume 6): Increasing the value of PLM with innovative new technologies</i>. Springer Hauschild, M. Z., Rosenbaum, R. K., & Olsen, S. I. (2020). <i>Life cycle assessment: Theory and practice</i>. Springer. Muthu, S. S. (Ed.). (2021). <i>Life cycle sustainability assessment (LCSA)</i>. Springer. Ciroth, A., & Arvidsson, R. (Eds.). (2021). <i>Life cycle inventory analysis: Methods and data</i>. Springer. Additional literature: Passarini, F., & Ciacci, L. (Eds.). (2021). <i>Life cycle assessment (LCA) of environmental and energy systems</i>. MDPI. Crawford, R. (2020). <i>Life cycle assessment in the built environment</i> (2nd ed.). Routledge. Journals: <i>Journal of Cleaner Production</i> (Elsevier). https://www.sciencedirect.com/journal/journal-of-cleaner-production <i>Sustainability</i> (MDPI). https://www.mdpi.com/journal/sustainability <i>Procedia CIRP</i> (Elsevier). https://www.sciencedirect.com/journal/procedia-cirp			
Teaching and Learning Methods	The course is delivered using a combination of traditional and modern teaching methods to ensure the acquisition of theoretical knowledge and the development of practical skills. The main methods include: • Structured Lectures – for presenting fundamental and advanced concepts. • Problem-Based Learning (PBL) – students work on solving real problems by researching and applying innovative solutions. • Flipped Classroom – learning materials are provided in advance, while class time is used for discussions, hands-on activities, and practical applications. • Project-Based Learning – development of complete projects simulating industrial scenarios. • Case Study Method – analysis and discussion of real-world industry situations to understand practical applications.			
	Contribution to student workload (which should correspond to student learning outcomes - 1 ECTS credit = 25 hours)			
	Activity	Hours	Days/weeks	Total
	Lectures	2	15	30
	Exercise sessions (with TA)	2	15	30
	Practical work	3	3	9
	Office hours	1	15	15
	Fieldwork	1	2	2
	Midterms, seminars	2	2	4
	Homework	3	2	6
	Self-study	4	3	12
	Final exam preparation	3	3	9
	Time spent in exams	2	2	4

	Projects, presentations, etc.	2	2	4
Total				125

Evaluation	Assessment Methods and Criteria:		
	Activity	Weight (%)	
	Midterm Exam	30%	
	Project Report & Defense	20%	
	Seminar Presentation	10%	
	Final Exam	40%	
	Total	100%	
	(according to the Statute and Regulation for studies of UMIB)		
	Final grade	Points (%)	Mark
		91 – 100	10
		81 - 90	9
		71 - 80	8
		61 - 70	7
		51 - 60	6
Academic policies	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.		
	Plagiarism or cheating will be penalized according to university regulations.		