



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:	104MTM	
Course:	Factory Planning and Lean Manufacturing	
Course Status:	Mandatory	Mandatory/Elective
Semester:	I	Winter/Summer
Number of hours per week:	2+1	
ECTS:	5	
Time / location:	Monday, 9 ⁰⁰ -10 ³⁰ , K5	
Academic Year / Semester	2026/2027	
Language of Instruction:	Albanian (with flexibility in English)	
Lecturer:		
Assistant:		
Contact details:	Professor	Assistant
Email:		
Telephone:		
Course Description	This course covers essential concepts of factory planning and lean manufacturing. It focuses on methods and tools for designing efficient production systems and optimizing factory layouts. Lean principles are applied to eliminate waste, improve quality, and reduce costs in industrial environments.	
Course Purpose / Course Goals	The course aims to equip students with in-depth knowledge and practical skills in planning efficient factory systems and implementing lean manufacturing strategies. Emphasis is placed on integrating modern planning tools with lean philosophies to improve productivity, reduce waste, and align operations with Industry 4.0/5.0 principles.	
Course Objectives	The objective of this course is to provide students with comprehensive knowledge and practical skills in planning and organizing efficient factory systems and applying lean manufacturing principles. The course emphasizes a systems approach to factory design, waste elimination, process optimization, and the integration of lean tools to improve productivity, quality, and responsiveness in modern manufacturing environments.	

Intended Learning Outcomes (ILOs)	Knowledge
	- K1: Explain the fundamental principles of factory planning and lean manufacturing. - K2: Describe different types of production layouts and lean tools such as 5S, VSM, Kanban, and SMED.
	Skills
	- S1: Design basic layouts for manufacturing systems and analyze workflow efficiency. - S2: Apply lean tools to identify and eliminate waste in production systems. - S3: Conduct value stream mapping and propose improvements.
	Competences
	- C1: Collaborate on designing lean-oriented production systems. - C2: Assess and justify changes in plant layout or production flow. - C3: Implement continuous improvement strategies in production environments.

	Weeks	Lecture
Program	<i>First week</i>	Introduction to factory planning and lean principles
	<i>Second week</i>	Types of factories and plant design considerations
	<i>Third week</i>	Systematic layout planning (SLP)
	<i>Fourth week</i>	Material flow and logistics in factory planning
	<i>Fifth week</i>	Lean tools overview: 5S, VSM, TPM
	<i>Sixth week</i>	Workplace organization and 5S implementation
	<i>Seventh week</i>	Value Stream Mapping (VSM) in practice
	<i>Eighth week</i>	Midterm Exam
	<i>Ninth week</i>	Lean metrics and performance indicators
	<i>Tenth week</i>	Cellular manufacturing and line balancing
	<i>Eleventh week</i>	Simulation in factory layout planning
	<i>Twelfth week</i>	Case studies in lean manufacturing
	<i>Thirteenth week</i>	Sustainability and green manufacturing
	<i>Fourteenth week</i>	Case studies and best practices
	<i>Fifteenth week</i>	Student project presentations and discussion

Literature / Reading List:

Literature	1. Mikell P. Groover – 'Automation, Production Systems, and Computer-Integrated Manufacturing' J.P. Womack, D.T. Jones – 'Lean Thinking' Additional materials provided by the instructor
	2. Womack, J. P., & Jones, D. T. (2003). Lean Thinking: Banish Waste and Create Wealth in Your Corporation.
	3. Liker, J. K. (2004). The Toyota Way: 14 Management Principles.
	4. Santos, J. R., Wysk, R. A., & Torres, J. A. (2006). Improving Production with Lean Thinking.
	5. Setiawan, R., et al. (2023). Review of Value Stream Mapping in Manufacturing.
	6. Zahraee, S. M., et al. (2014). Simulation of lean production systems using VSM.
	7. Lean Enterprise Institute. (2017). Understanding the Fundamentals of Value-Stream Mapping.
	8. Bicheno, J., & Holweg, M. (2016). The Lean Toolbox for Service Systems.
	9. Additional materials provided by the instructor

Teaching and Learning Methods	- Lectures with multimedia presentations - Case studies and group work - Practical exercises and simulations (e.g., VSM, layout redesign) - Guest lectures from industry - Individual and team projects - PBL - Flip classroom.			
	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)	1	15	15
	Practical work	3	3	9
	Office hours	1	15	15
	Fieldwork	1	2	2
	Midterms, seminars	2	2	4
	Homework	3	5	15
	Self-study	4	3	12
	Final exam preparation	3	4	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	20%	
	Project Report & Defense	30%	
	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	Criteria for regular attendance and rules of etiquette during the organization of the lesson are set. Attendance, Ethics and Deadlines Criteria for regular attendance and rules of conduct during the teaching process are established. Students are expected to actively participate in lectures, exercises, case studies, simulations, and group discussions related to factory planning and lean manufacturing practices. Computer-Based Work Assignments, project reports, factory layout designs, process analyses, and presentations must be prepared using a computer. Students are required to comply with technical, analytical, and professional standards, ensuring both the quality of content and the visual presentation of their work. Proper use of diagrams, charts, process maps, and relevant software tools is encouraged. Academic Ethics All assignments, projects, and reports must be the original work of the student or the assigned group. Plagiarism, copying, or the use of materials from the internet or other sources without proper citation and referencing will not be tolerated. Identical or substantially similar submissions will be considered a violation of academic integrity and will receive negative evaluation. Deadlines Submission deadlines for assignments, projects, and reports will be determined in agreement with the students. Late submissions will not be accepted without valid justification. Absence from the class when an assignment is explained does not exempt the student from the responsibility of completing and submitting the work. Students who expect to be absent due to travel or other commitments should submit their work before the deadline whenever possible. Consultations Students have the right to request consultations with the instructor regarding assignments, projects, factory layout designs, process improvement analyses, and other course-related activities whenever necessary. 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.
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