



Course Curriculum Model (Syllabus)		
Faculty:	FACULTY OF MECHANICAL AND COMPUTER ENGINEERING	
Department:	Mechanical Engineering	
Level:	Bachelor	
Code of the course:	310 ME	
Course:	<b>Manufacturing Automation and Robotics</b>	
Course Status:	-	Mandatory, <b>Elective</b>
Semester:	(V)	Winter/ <b>Winter</b>
Number of hours per week:	2+2	
ECTS:	5	
Time / location:	Monday, 12 <sup>00</sup> -13 <sup>30</sup> , S308	
Year of studies:	2021/2022	
Lecturer:	Prof Ass Dr. Fitim Zeqiri	
Assistant:	Prof Ass Dr. Fitim Zeqiri	
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<b>C o u r s e d e s c r i p t i o n</b>	This course provides a comprehensive exploration of automation and control systems, covering the fundamental principles, components, and applications in both production and service activities. Participants will gain insights into various automated systems, including numerical control, industrial robotics, Programmable Logical Controllers (PLCs), Flexible Manufacturing Systems (FMS), and Computer Integrated Manufacturing (CIM). Additionally, the course covers essential concepts related to programming languages, interfaces, and communication protocols in the context of automation.	
<b>P u r p o s e</b>	The purpose of the "Automation and Control Systems" course is to provide participants with a thorough understanding of automation principles and control systems in the context of both production and service activities.	

A c c e s s i b i l i t y	<p>Upon successful completion of this course, students will be able to:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Clearly explain the automated production systems</li> <li><input type="checkbox"/> Understand Industrial communication tools and instruments</li> <li><input type="checkbox"/> Clearly explain complex industrial communication system.</li> <li><input type="checkbox"/> Understand Industrial Robots and Programming Robots</li> </ul>
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	Weeks	Lecture
P r o g r a m	<i>First week:</i>	Contents of the course program: Introduction in automation.
	<i>Second week:</i>	Application of automation in production and service activities.
	<i>Third week:</i>	Basic elements of automated systems. Types of automation.
	<i>Fourth week:</i>	Numerical control. Application of Numerical Control and DNC.
	<i>Fifth week:</i>	Industrial robotics. Application of industrial robots.
	<i>Sixth week:</i>	Programmable Logical Controllers.
	<i>Seventh week:</i>	Flexible Manufacturing Systems (FMS).
	<i>Eighth week:</i>	Application of Flexible Manufacturing Systems (FMS) and their advantages.
	<i>Ninth week:</i>	CAD, CAM, CAD/CAM and CAQ
	<i>Tenth week:</i>	Computer Integrated Manufacturing (CIM).
	<i>Eleventh week:</i>	Introduction to robotics, Rigid movements and homogeneous transformations.
	<i>Twelfth week:</i>	Direct and inverse kinematics Jacobians.
	<i>Thirteenth week:</i>	Movement generator and trajectory; Statics, Dynamics;
	<i>Fourteenth week:</i>	Control of robots and PLC.
	<i>Fifteenth week:</i>	CAE and Digital Factory.

Literature	
L i t e r a t u r e	<p>[1] Mikell P. Groover, <b>Automation, Production Systems, and Computer- Integrated Manufacturing</b>, 2007</p> <p>[2] Suk-Hwan Suh, Seong- Kyoong Kang, Dae-Hyuk Chung, Ian Strou , <b>Theory and design of CNC systems</b> 2008.</p> <p>[3] Bruno Siciliano and Oussama Khatib, <b>Handbook of Robotics</b>, 2008.</p> <p>[4] Tullio Tolio , <b>Design of Flexible Production Systems: Methodologies and Tools</b> 2019.</p>

Lectures, exercises, individual work, experimental work, seminar papers, colloquia, essays, field work, group work, etc. Completed according to the specifics of your subjects!			
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
<b>Total</b>			<b>125</b>

<b>E v a l u a t i o n</b>	<b>Teaching methodology:</b> (according to the Statute and Regulation for studies of UMIB)		
	Tests / Colloquia (First Test) (Second test)		15% 15%
	Practical test during exercises (Essay)		
	Workshop seminar		
	Interpretation and presentation of artistic creativity and other works.		
	Assignments and courses during the semester		15%
	Professional practice.		
	Other, Continuity		
	Final exam		55%
	Total	:	100%
	Final grade	Pikët (%)	Nota
		91 – 100	10
		81 - 90	9
	71 - 80	8	
	61 - 70	7	
	51 - 60	6	

**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.

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Mitrovica; 15/04/2023

Prof Ass Dr. Fitim Zeqiri