	UNEVERSITY OF EAST SARAJEVO Faculty of Mechanical Engineering	
	Study program: Mechanical Engineering	
	1ST LEVEL OF STUDIES | 4th YEAR	

Course title	**Computer control of machine tools**
Department	Department of production engineering

Code		**Course status**	**Semester**	**ECTS**
МАФ-1-1-МC-06-1-038-7-5-2-0-2		Mandatory	VII	5

Professor	PhD Aleksandar Kosarac, assistant professor
Teaching assistant	MSc Lana Sikuljak, senior assistant

Number of hours (per week)			**Individual student workload (in hours in semester)**			**Coefficient of student workload S_o**
L	**E**	**LE**	**L**	**E**	**LE**	**S_o**
2	0	2	$2*15*S_o$	$0*15*S_o$	$2*15*S_o$	1.4

Total total teaching hours in semester $2*15 + 0*15 + 2*15 = 60$ hours	Total student's workload (in hours in semester) $2*15*So + 0*15*So + 2*15*So = 84$ hours
Total course workload: 60 + 84 = 144 hours in semester	

Student learning objectives	Acquiring basic knowledge required for operation and programming of numerically controlled machine tools using manual programming, APT programming language and CAM systems. Learn methods and techniques of programming CNC machine tools for machining performed on lathe centers and milling centers.
Conditionality	No conditioning
Teaching methods	Lectures, laboratory exercises, homework, consultations, partial exams, final exam. During the laboratory exercise technology of manual programming, APT programming language and CAM systems are used to generate G code.
Content of the course by weeks	1. Introduction to numerically controlled (NC) machine tools 2. Functional and kinematic structure of numerically controlled machine tools 3. Basics and principles of numerical controlled programming 4. Syntax and semantics of NC program, NC program development methodology, clamping, process plans, setup sheet 5. G and M functions 6. Program code 7. Typical examples of NC programming 8. APT programming language 9. Elements of APT 10. APT geometry 11. APT kinematics 12. Tool movement in APT 13. Program structure in APT 14. Typical examples in APT 15. CAM systems and automatic NC code generation

Required literature			
Authors	**Name of the publication, publisher**	**Year**	**Pages**
Зељковић, М., Табаковић, С, Антић, А.	Програмирање нумерички управљаних обрадних система, Универзитет у Новом Саду, Факултет техничких наука	2013.	-
Чича, Ђ., Јокановић, С.	Програмирање нумерички управљаних машина алатки, Универзитет у Бања Луци, Машински факултет	2014.	-

Additional literature			
Authors	**Name of the publication, publisher**	**Year**	**Pages**
Лукић, С., Љ.	Флексибилни технолошки системи, структура, конструкција, управљање и технологија, Машински факултет Краљево	2008.	-
П.Бојанић, Р.Пузовић	Производни системи - АРТ језик, Машински факултет, Београд	2002.	

Obligations, forms of knowledge check	**Type of student evaluation**		**Points**	**Percentage**
	Pre-exam obligations			
	Attendance at lectures / exercises		5	5%

and assessment	Laboratory exercises (homework)	25	25%
	Colloquium I	15	15%
	Colloquium II	15	15%
	Final exam	40	40%
	Total	100	100 %
Web page			
Date of certification			