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

Course title	**VIRTUAL PRODUCT DEVELOPMENT**
Department	Department of Mechanical constructions and Engineering Design

Code	**Course status**	**Semester**	**ECTS**
МАФ-1-2-МС-02-2-099-8-5-2-1-1	Elective	VIII	5

Professor	PhD Biljana Marković, full professor
Teaching assistant	M. Sc.Aleksija Đurić - teaching 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	1	1	$2*15*S_o$	$1*15*S_o$	$1*15*S_o$	1.4

Total total teaching hours in semester 2*15 + 1*15 + 1*15 = 60 hours	Total student's workload (in hours in semester) $2*15*S_o + 1*15*S_o + 1*15*S_o$ = 84 hours
Total course workload: 60 + 84 = 144 hours in semester	

Student learning objectives	1. Introduction to the possibilities and limitations of the application of information technology in the process of product development; 2. Acquiring the ability to apply the methods of geometric modeling, product modeling and programming in PD. 3. Enabling students to apply virtual product development independently and on scientific principles; 4. Introducing students to relevant software packages used in product development; 5. Acquiring knowledge of the principles of product design in a virtual reality environment, making virtual models and performing various analyzes in a VR environment.
Conditionality	Basic of constructions
Teaching methods	Lectures, exercises, graphic exercises, computer exercises, laboratory exercises and team work
Content of the course by weeks	1. Introduction: Virtual product development requirements. Fundamental concepts of virtual product development. 2. Application of CAD and Cax. Limitations and the future of virtual product development. 3. Geometric modeling: Introduction. Types of geometric models. Parametric models. Current use of CAD. 4. Associative modeling. Examples of geometric modeling. 5. Product modeling: Introduction. product information modeling. Modeling product. Modelineation via feature. 6. Application of product modeling. Examples of product modeling. 7. Integrated, Distributed and Collaborative Systems: An Introduction. Concepts of data exchange and interoperability. Data exchange in neutral formats: SAT, STEP, IGES, VDAFS. 8. Computer-assisted teamwork. Team and study research work. Input data and zs Seminar paper through which the student will apply the acquired knowledge on a real product. 9. Information Systems: Product Lifecycle Management (PLM). Product Data Management (PDM). 10. Computer-Aided Manufacturing and Rapid Prototyping: An Introduction. Classes of fast technologies. The process of rapid prototyping. Types, methods, tools for rapid prototyping; 11. Rapid prototyping technology. The process of making tools quickly. Computer-aided manufacturing (CAM). Application of rapid prototyping and CAM. 12. Conclusion. Rule-based systems. The life cycle of the knowledge system. Software packages for knowledge systems. 13. Defense and discussion of a seminar paper. Results of teamwork, distributed teamwork, communication in virtual product development. Means and methods of communication in distributed virtual projects. 14. Computer components for VR. The hardware structure of VR devices, division and principles of operation. 15. Programming languages for programming in virtual reality - VRML

Required literature

Authors	**Name of the publication, publisher**	**Year**	**Pages**
B. Marković	Script – VPD	2020.	-

Additional literature

Authors	**Name of the publication, publisher**	**Year**	**Pages**

			-

	Type of student evaluation	Points	Percentage
Obligations, forms of knowledge check and assessment			
	attendance at lectures / exercises	5+5	10%
	Seminar paper	20	20%
	Colloquium I and II + Written exam	20+20	40%
	final exam (oral / written)	30	30%
	Total	100	100 %
Web page	http://www.maf.ues.rs.ba/PDF_za_sajt/MKRP2017/Virtuelni%20razvoj%20proizvoda.pdf (in Serbian language)		
Date of certification			