

Faculty of Mechanical Engineering / MECHANICAL ENGINEERING / BASIC OF CONSTRUCTION

Course:	BASIC OF CONSTRUCTION			
Course ID	Course status	Semester	ECTS credits	Lessons (Lessons+Exercises+Laboratory)
12198	Mandatory	1	6	3+0+2
Programs	MECHANICAL ENGINEERING			
Prerequisites	None.			
Aims	Through this course, students are introduced to the basic rules, methods and procedures in the construction of machines.			
Learning outcomes	After passing the exam in this subject, students will be able to: 1. Recognize the basic requirements that are placed before the designer and arrange them hierarchically. 2. Form a technical task. 3. Use a scientific approach in solving construction problems. 4. Apply Methodical Design procedures in product development. 5. Application of Methodical Designing procedures in the selection of optimal solutions. 6. Develop the optimal shape of the structure concerning function, flow of stress, and deformation, then requirements regarding technology, materials used, ergonomics, aesthetics, exploitability, and economy of the structure.			
Lecturer / Teaching assistant	Prof. dr Radoslav Tomović			
Methodology	Lectures and exercises in the computer classroom/laboratory. Learning and independent preparation of practical tasks. Consultations.			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	General principles in product design and construction. Tasks of constructors. Factors that should be taken into account when designing a product.			
I week exercises	General principles in product design and construction. Tasks of constructors. Factors that should be taken into account when designing a product.			
II week lectures	Methodical elaboration of the product designing process. The flow of the product designing process. A practical method of product design.			
II week exercises	Methodical elaboration of the product designing process. The flow of the product designing process. A practical method of product design.			
III week lectures	Defining the task. Technical task. List of requests. Functional structure.			
III week exercises	Defining the task. Technical task. List of requests. Functional structure.			
IV week lectures	Physical effects. Principles of solutions. Morphological matrix. Physical model of the structure.			
IV week exercises	Physical effects. Principles of solutions. Morphological matrix. Physical model of the structure.			
V week lectures	Constructive design. Design of working pairs, working surfaces, and working bodies. Movement shaping.			
V week exercises	Constructive design. Design of working pairs, working surfaces, and working bodies. Movement shaping.			
VI week lectures	Interference analysis. Selection of the most favorable variant. Conceptual design solution.			
VI week exercises	Interference analysis. Selection of the most favorable variant. Conceptual design solution.			
VII week lectures	Colloquium I.			
VII week exercises	Colloquium I.			
VIII week lectures	Constructional elaboration. Factors affecting the final shape of the design. Selection of dimensions and shape concerning function.			
VIII week exercises	Constructional elaboration. Factors affecting the final shape of the design. Selection of dimensions and shape concerning function.			
IX week lectures	The influence of stress and deformation on the shape of the structure. Stress concentration.			
IX week exercises	The influence of stress and deformation on the shape of the structure. Stress concentration.			
X week lectures	Forms and fatigue of materials. Load capacity calculation. Safety degree.			
X week exercises	Forms and fatigue of materials. Load capacity calculation. Safety degree.			
XI week lectures	Selection of materials. Factors affecting the selection of materials. Wear and corrosion.			

XI week exercises	Selection of materials. Factors affecting the selection of materials. Wear and corrosion.					
XII week lectures	Designing and tolerances. Tolerances of measurements, shapes, and positions. Surface quality. Adjustment systems. Selection of the type of overlay. Pressed assemblies.					
XII week exercises	Designing and tolerances. Tolerances of measurements, shapes, and positions. Surface quality. Adjustment systems. Selection of the type of overlay. Pressed assemblies.					
XIII week lectures	The influence of manufacturing technology on design. Ergonomics of design.					
XIII week exercises	The influence of manufacturing technology on design. Ergonomics of design.					
XIV week lectures	Conditions of exploitation and operation and design. The impact of legal regulations and norms on construction. The influence of product price and costs on design.					
XIV week exercises	Conditions of exploitation and operation and design. The impact of legal regulations and norms on construction. The influence of product price and costs on design.					
XV week lectures	Colloquium II.					
XV week exercises	Colloquium II.					
Student workload						
Per week			Per semester			
6 credits x 40/30=8 hours and 0 mins 3 sat(a) theoretical classes 2 sat(a) practical classes 0 exercises 3 hour(s) i 0 mins of independent work, including consultations			Classes and final exam: 8 hour(s) i 0 mins x 16 =128 hour(s) i 0 mins Necessary preparation before the beginning of the semester (administration, registration, certification): 8 hour(s) i 0 mins x 2 =16 hour(s) i 0 mins Total workload for the subject: 6 x 30=180 hour(s) Additional work for exam preparation in the preparing exam period, including taking the remedial exam from 0 to 30 hours (remaining time from the first two items to the total load for the item) 36 hour(s) i 0 mins Workload structure: 128 hour(s) i 0 mins (courses), 16 hour(s) i 0 mins (preparation), 36 hour(s) i 0 mins (additional work)			
Student obligations			Mandatory attendance of classes and creation of a laboratory project.			
Consultations						
Literature			1. R. Tomović, Osnove konstruisanja, Mašinski fakultet u Podgorici, 2015. 2. R. Tomović, Konstruisanje mašina - praktikum - Skripta. Mašinski fakultet u Podgorici, (2001) 3. D. Vitas, Osnovi mašinskih konstrukcija, Naučna knjiga Beograd, 1989. 4. J. Vugdelija i ostali, Zbirka zadataka iz Osnova Konstruisanja, 1974 5. E. Oberšmit, Nauka o konstruisanju, metodičko konstruisanje i konstruisanje pomoću računara, FSB Zagreb, 1985			
Examination methods			2 x colloquium 10% each (total 20%) Laboratory project: 40%; Final exam: 40% Passing grade is obtained if min. 50% of the points and if at least 51 points are accumulated cumulatively.			
Special remarks						
Comment						
Grade:	F	E	D	C	B	A
Number of points	less than 50 points	greater than or equal to 50 points and less than 60 points	greater than or equal to 60 points and less than 70 points	greater than or equal to 70 points and less than 80 points	greater than or equal to 80 points and less than 90 points	greater than or equal to 90 points