

**Training plan in the topic group of  
DESIGN OF MACHINES AND STRUCTURES**

**I. Training plan for the educational-research programme**

	Semester			
	I.	II.	III.	IV.
<b>1. Natural sciences foundation</b> (min. 3 subjects required)				
<b>Mathematics</b>				
Modern Analysis_GEMAN402-a	o			
Differential and Integral Equations GEMAN411-a		x		
Numerical Methods I_ GEMAK411-a		x	x	
Numerical Methods II. GEMAK412-a			x	
Methods of Optimization GEMAK 413-a			x	
<u>Other optional subjects in mathematics</u>	x	x	x	
<b>Mechanics</b>				
Continuum Mechanics GEMET401-a	o			
Mechanics of Non-elastic Materials GEMET405-a			x	
Finite Element Method GEMET407-a		x		
Thermodynamics I. GEAHT401-a		#		
Thermodynamics II. GEAHT402-a			x	
<u>Other optional subjects in mechanics</u>	x	x	x	
<b>2. Professional foundation</b> (min 1 subject required)				
Material Science GEMTT500P	o			
Fundamentals of Machine Component Design GEGET405-a		#		
Measurement Systems GEVAU407-a		x	x	
<u>Other optional subjects</u>	x	x	x	
<b>3. Subjects for the complex examination</b> (min 2 subjects required)				
<b>3.1. Material handling machine design</b>				
Theory of Material Handling Machines GEALT401-a		+		
Theory of Material Flow Systems GEALT407-a			x	
Theory of Warehouse Machines, Equipments and Loading Machines GEALT403-a			x	
Automation and Robotization of Materials Handling Machines and Systems GEALT405-a			x	
<u>Other optional subjects</u>	x	x	x	

<b>3.2. Design of machines and elements</b>				
Conceptual Design GEGET401-a		+		
Engineering Design of Machine Structures GEGET402-a			X	
Computer Aided Design of Machine Elements GEGET404-a		X		
Modelling and Simulation in Engineering GEGET420-a			X	
<u>Other optional subjects</u>	X	X	X	
<b>3.3. Product development and design</b>				
Conceptual Design GEGET401		+		
Multidisciplinary Optimization of Machine Elements GEGET416-a		X		
Lifetime oriented design GEGET418-a			X	
Engineering Acoustic GEGET408-a			X	
<u>Other optional subjects</u>	X	X	X	
<b>3.4. Design of mechatronic systems</b>				
Mechatronic Systems GEMRB400-a		+		
Kinematics and Motion Control of Industrial Robots GEMRB405-a			X	
Simulation of Mechatronic Systems GESGT402-a			X	
<u>Other optional subjects</u>	X	X	X	
<b>3.5. Design of engineering structures</b>				
Analysis of Engineering Structures I. GEVGT465-a	+			
Analysis of Engineering Structures II. GEVGT466-a		X		
Structural Optimization GEVGT467-a			X	
Design and optimisation of fiber reinforced plastic structures GEGTT474-a			X	
<u>Other optional subjects</u>	X	X	X	
<b>3.6. Energy and chemical engineering systems design</b>				
Mechanical Separational Techniques GEVGT403-a		+		
Heat and Mass Transfer GEVGT401-a			X	
Process modelling GEVGT402-a			X	
Design of Pressure Vessel GEVGT404-a		X		
<u>Other optional subjects</u>	X	X	X	
<b>3.7. Design of machine tools</b>				

Methodical Design of Machine Tools GESGT412-a		+		
Design of Production Devices GESGT414-a			x	
Special purpose machines and production systems GESGT418-a			x	
<u>Other optional subjects</u>	x	x	x	
4 hours per week of teaching work in graduate courses	t	t	t	t
Research work	k	k	k	k
Written research report		b		b

- o - the subject is compulsory,
- x - optional from the given group of subjects
- # - compulsory for non-engineering graduates
- + - compulsory from the chosen subject group
- t - teaching activity,
- k - research work,
- b - report

## II. Training plan for the research and dissertation phase

In the second four-semester research and dissertation phase, the doctoral student carries out basic research work, publishes the results of his/her research and prepares a thesis suitable for scientific workshop discussion.

In this phase of the doctoral programme, it is of paramount importance that the credits needed to complete the 240 credits required for the full programme are obtained through research and publication activities in addition to those acquired in the first four semesters.

The requirements for research and publication credits are set out in the School's credit system, which is also available on the School's website.

Research credits may be obtained

- a) independent research on a dissertation topic, the results of which the doctoral student shall present in a written and peer-reviewed thesis submitted to the Doctoral School every semester, as well as at a related research seminar: the maximum value of this research shall be 15 credits per semester;
- b) additional credits may be obtained by participating in research projects related to departmental research. The maximum value per semester is 5 credits.

Also at this stage of the training, a maximum of 5 credits per semester may be awarded for contributions to teaching activities, but not more than 6 semesters in any eight semesters of training.