

ACADEMIC YEAR 2026/27. 1ST SEMESTER

Name of subject: Industrial Technologies and Machines I. (blended)		NEPTUN-code: RTEIT1EBNF	Number of hours: lec+gs+lab 1+0+1	Credit: 4 Requirements: term mark
Course coordinator: Gabriella Oroszlány Ph.D.		Title: assistant lecturer	Prerequisite: (-)	
Curriculum:				
Machinery fundamentals, basic concepts, principles and operational requirements are closely related to the product design expertise area. Operation, development and relations of structural units and building elements of ubiquitous machines of industrial technologies and simple technical systems. Kinematic basic concepts and fundamental mechanisms. Mechanisms of degrees of freedom (DOF calculations), structural - kinematic analysis. The material processing and manufacturing process technology associated with each step of the special equipment, their structure, operating principles and basic concepts. Textile machinery, non-woven fabrics production machines, production machines for knitted products. Finishing machines, equipment used for painting and patternmaking. Types and operating principles of equipment for key packaging products and packaging operations. The latest development trends, solutions and innovations.				
Detailed schedule of the course:				
Week	Topics of lectures and practices/labs			Lecturer
1	History of spinning, development of basic spinning tools, spinning technology. Main types of machines used in yarn production, their characteristics and applications.			Rudolf Szabó
2	Specific spinning technologies. Yarn testing methods, gauge calculation.			Rudolf Szabó
3	Artificial alteration of yarn properties and characteristics for use. Spreading technology, equipment and properties of spread yarns.			Rudolf Szabó
4	Technology and equipment for producing nonwovens.			Rudolf Szabó
5	History of weaving. The development of basic weaving tools, weaving technology. Basic concepts related to weaving and fabrics. The main types of machines used in weaving, their characteristics and uses.			Rudolf Szabó
6	Technical characteristics of woven fabrics (area density, thickness, etc.). Basic weaves (plain weave, twill weave, atlas weave).			Rudolf Szabó
7	History of knitting, evolution of basic knitting tools, and knitting technology. Basic concepts of knitting and knitted fabrics. Main types of machines used in knitting, their characteristics and applications.			Rudolf Szabó
8	Basic knitting technology and characteristics of knitted fabrics. Practical production of knitted fabrics.			Rudolf Szabó
9	Textile technology and equipment I. Systematisation of textile manufacturing operations (saturation, drying, condensation, pile raising, shearing, pre-cleaning, sanding, scouring, calendaring, creping technology and equipment).			Rudolf Szabó
10	Basic kinematic concepts, basic mechanisms. Definition of degrees of freedom of mechanisms, structural - kinematic analysis.			Rudolf Szabó
11	Textile finishing technology and equipment II. Fake creping, prage calendaring, tufting, textile engraving, textile abrasion, laser cutting, devoré printing, flocculation, embossing, lacquer finishing, antibacterial finishing, special finishing processes, carbon repellent finishing, deodorant finishing, antimicrobial finishing, mite and moth proofing. Degree of Freedom Calculation - investigation of planar and spatial mechanisms - practical calculation exercises.			Rudolf Szabó

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12	Break	(-)
13	Seminary online test (written exam). Deadline for submission of individual or group assignments issued during the semester	Rudolf Szabó
14	Supplementary Test. Supplementary submission of tasks. Evaluation.	Rudolf Szabó
<i>Mid-term requirements:</i>		
<i>Attendance at lectures and practices/labs</i> Attendance at the exercises is compulsory, absence according to the TVSZ. Attendance at lectures is also compulsory, for the successful completion of the semester (exam) knowledge of the material presented in the lectures is required.		
<i>Seminary tests, reports, essays, etc.</i> Week 13 – Test (written exam) Week 13 - deadline for individual or group assignments due during the semester Week 14 - revision and supplementary tests Week 14 - submission of supplementary assignments Development and presentation of a tutoring plan		
<i>The method of obtaining a signature/creating a practice mark:</i> The mid-term grade is conditional on: - valid participation in the exercises, - the assignments, submitted and accepted in the form of a report on the topics of the exercises, - 1 final paper of approximately 60 minutes, graded with a satisfactory mark (the final paper will consist of material from the online lectures and the exercises - it will be a test and will be different from the lectures). To obtain a satisfactory final examination grade, a minimum of 40% of the maximum mark must be achieved and may be made up once. The mid-semester grade will be based on the result of the final examination. The relevant provisions of the current Study and Examination Regulations apply to the replacement of the mid-term mark.		
<i>Professional competencies:</i>		
– Knowledge of basic design principles and methods, as well as major production technology procedures and operating processes. – Knowledge of the most important basic materials applied in the special area of product design, their production and their application criteria. – Able to interpret and characterize the structure and operation of the structural units and components of relatively simple technical systems, as well as the design and connection of the system components applied. – Able to explore the causes of failures and to select elimination operations.		
<i>Literature:</i>		
1. Steven R. Schmid, Bernard J. Hamrock, Bo. O. Jacobson: Fundamentals of Machine Elements, ISBN 9781439891322 2. Machine elements, handbook, http://www.gbi.bgk.uni-obuda.hu/oktatas/segedanyagok/gepelemek/Machine_Design_2/Machine%20Element.pdf 3. https://elearning.uni-obuda.hu/ electronic notes and aids prepared by the instructor		