No. 9

Course syllabus for First cycle studies		
1.	**Course title**	Textile fibers 1
2.	**Code**	CDE3M1
3.	**Study Program**	Clothing Design and Engineering
4.	**Study program organizer (unit, institute, department, division)**	Faculty of Technology and Metallurgy, Institute of Textile Engineering
5.	**Degree (first, second, third cycle)**	First

6.	**Academic year / semester**	2 year 3 semester	7.	**Number of ECTS**	7

8.	**Instructors**	Prof. Dr. Igor Jordanov
9.	**Prerequisites for course enrollment**	No

10.	**Objectives of the course syllabus (competences):** Students will acquire an understanding of the production, structure, properties, and applications of natural textile fibers derived from plant, animal, and mineral sources. **Acquired skills (competences):**

11.	**Content of the course:** **Fiber Characterization:** **Methods of Obtaining High-Molecular Compounds**: Techniques for synthesizing polymers, including polymerization and polycondensation processes. **Molecular and Supramolecular Structure of Fibers**: Understanding the detailed molecular arrangements and higher-level structures that define fiber properties and behavior. **Primary Fiber Properties**: **Length**: Measurement of fiber dimensions. **Fineness**: Determination of fiber diameter or thickness. **Tensile Strength and Elongation at Break**: The fiber's resistance to breaking under tension and its ability to stretch before failure. **Flexibility**: The capacity of fibers to bend without breaking. **Cohesiveness**: The ability of fibers to hold together. **Uniformity**: Consistency in fiber characteristics, including diameter and structure. **Secondary Fiber Properties**: **Morphological Characteristics**: Shape, surface texture, and cross-sectional structure of fibers. **Moisture and Water Absorption**: The fiber's ability to absorb and retain moisture. **Thermal Properties**: Heat resistance and thermal conductivity of fibers. **Fiber Density**: Mass per unit volume of the fiber. **Elastic Recovery**: The fiber's ability to return to its original shape after deformation. **Electrical Properties**: Conductivity, resistance to electric current, and static charge accumulation. **Optical Properties**: Light interaction with the fiber, including color and sheen. **Other Properties**: Any additional relevant characteristics that affect fiber

	performance.
	• **Natural Cellulose Fibers**:
	  ○ **Cellulose Structure and Properties**: The molecular makeup and unique qualities of cellulose that define fiber behavior.
	  ○ **Cotton, Flax, Hemp, Jute, and Ramie**: Properties and applications of common plant-based fibers.
	• **Natural Animal Fibers**:
	  ○ **Protein Structures (Keratin and Fibroin)**: The molecular structures of animal-based fibers, focusing on keratin in wool and fibroin in silk.
	  ○ **Wool and Silk**: Characteristics, properties, and uses of these fibers.
	• **Mineral Fibers**:
	  ○ **Asbestos**: Structural and industrial properties, along with the historical use and associated health concerns.

12.	**Study methods:** lectures and consultations, laboratory exercises, homework, home study (exam preparation)

13.	**Total available time**		240	
14.	**Allocation of available time**			
15.	**Teaching activities**	15.1.	Lectures theoretical teaching	45
		15.2.	Exercises (laboratory, numerical, seminars, teamwork)	45
16.	**Other types of activities**	16.1.	Projects	20
		16.2.	Independent tasks	20
		16.3.	Homework and self-learning	110

17.	**Grading system**		
	17.1.	Test	80 points
	17.2.	Successfully realized laboratory/auditory exercises	10 points
	17.3.	Individual work/homework	5 points
	17.4	Participation	5 points
18.	**Grading criteria (points/grade)**	Up to 61 points	5 (five) (F)
		From 61 to 69 points	6 (six) (E)
		From 70 to 79 points	7 (seven) (D)
		from 80 to 89 points	8 (eight) (S)
		From 90 to 95 points	9 (nine) (B)
		from 95 to 100 points	10 (ten) (A)
19.	**Prerequisites for taking the final exam**	11 points minimum from 17.2 – 17.4	
20.	**Language in which lectures are conducted**	English	
21.	**Method for monitoring the quality of lectures**	Survey	
22.	**LITERATURE**		
	22.1.	Compulsory literature	

No.	Author	Title	Publisher	Year

		1.	K. Ljapceva	Textile fibers	Teteks, Teplast	2006
		2.	I.Jordanov	Textile fibers	Internal script	2010
		3.				
22.2.		Additional literature				
		No.	Author	Title	Publisher	Year
		1.	S.J. Eichhorn, J.W.S. Hearle, M. Jaffe and T. Kikutani	Handbook of textile fibre structure Volume 2: Natural, regenerated, inorganic and specialist fibres	Woodhead publishing limited, Oxford, Cambridge, New Delh.	2009
		2.				
		3.				