No. 29

<table>
<tr><th colspan="6">Course syllabus for First cycle studies</th></tr>
<tr><td>1.</td><td>Course title</td><td colspan="4">Dyeing of textiles and clothing</td></tr>
<tr><td>2.</td><td>Code</td><td colspan="4">CDE6M3</td></tr>
<tr><td>3.</td><td>Study Program</td><td colspan="4">Clothing Design and Engineering</td></tr>
<tr><td>4.</td><td>Study program organizer (unit, institute, department, division)</td><td colspan="4">Faculty of Technology and Metallurgy, Institute of Textile Engineering</td></tr>
<tr><td>5.</td><td>Degree (first, second, third cycle)</td><td colspan="4">First</td></tr>
<tr><td>6.</td><td>Academic year / semester</td><td>2 year
3 semester</td><td>7.</td><td>Number of ECTS</td><td>6</td></tr>
<tr><td>8.</td><td>Instructors</td><td colspan="4">Prof. Dr. Igor Jordanov</td></tr>
<tr><td>9.</td><td>Prerequisites for course enrollment</td><td colspan="4">Textile fibers 2 (verfied)</td></tr>
<tr><td>10.</td><td colspan="5">Objectives of the course syllabus (competences):
Introduction to the basic concepts of the physics and chemistry of dyes, color metrics, color qualification, technological dyeing procedures and dyeing devices.

Acquired skills (competences):</td></tr>
<tr><td>11.</td><td colspan="5">Content of the course:
Color as a Physical Phenomenon:
An exploration of color as a physical property, including the principles of light absorption, reflection, and the perception of color.
Additive and Subtractive Color Mixing:
An overview of the two primary methods of color mixing:
• Additive Mixing: The process of combining light colors (e.g., red, green, and blue) to create other colors.
• Subtractive Mixing: The mixing of pigments or dyes, where colors are subtracted from white light, leading to color combinations like cyan, magenta, and yellow.
Color Theories:
A study of various color models and theories, such as the RGB model (used in digital media) and the CMYK model (used in printing), which help explain color relationships and the creation of color harmonies.
Color Qualification and Nomenclature:
Techniques for accurately identifying, describing, and naming colors based on standardized systems (e.g., Pantone, Munsell). This includes terms related to hue, saturation, and lightness.
Color Metrics:
The science of quantifying and measuring color, utilizing tools like spectrophotometers and colorimeters to assess hue, chroma, and brightness in precise terms.
Dyeing Theory:
An exploration of the chemical principles and processes involved in dyeing, including the</td></tr>
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	interaction between dyes and fibers, and the factors that affect color uptake and retention. **Dyeing of Cellulose Fibers**: Techniques for dyeing plant-based fibers like cotton, flax, and jute: • **Direct Dyes**: Used for simple, fast color application without the need for mordants. • **Reactive Dyes**: Chemical dyes that form a covalent bond with cellulose fibers for long-lasting color. • **Reductive Dyes**: Dyes that require reduction to become soluble and bond with cellulose. • **Leucoesters of Reductive Dyes**: Special dyes that undergo a reversible chemical change, enabling unique color characteristics. **Dyeing Wool**: Methods for dyeing animal fibers, primarily wool, with specific dye types: • **Acid Dyes**: Dyes that bond to wool fibers in an acidic environment, providing vivid and stable colors. • **Metal Complex Dyes**: Dyes that involve metal ions for enhanced color fastness and intensity. • **Reactive Dyes**: Dyes that chemically bond with wool, offering improved wash and light fastness. **Dyeing Synthetic Fibers**: Techniques for dyeing man-made fibers: • **Disperse Dyes**: Used for dyeing hydrophobic synthetic fibers like polyester, nylon, and acetate. • **Dyes for Natural Fibers**: Synthetic dyes adapted for use on natural fibers, offering compatibility across various fiber types. **Dyeing Polyacrylonitrile Fibers**: Methods specific to polyacrylonitrile (PAN) fibers: • **Cationic Dyes**: Special dyes that are attracted to the negatively charged sites on polyacrylonitrile fibers. • **Dyes for Natural Fibers**: Dyes designed for natural fibers, but also applicable to polyacrylonitrile under specific conditions. **Dyeing Equipment**: Overview of the machines and devices used in the dyeing process: • **Dyeing Machines**: Specialized equipment for the controlled application of dyes to textiles. • **Squeezing and Drying**: Techniques used to remove excess dye and moisture, and to dry textiles after the dyeing process, ensuring even color and stability.			
12.	**Study methods:** lectures and consultations, laboratory exercises, homework, home study (exam preparation)			
13.	**Total available time**		150	
14.	**Allocation of available time**			
15.	**Teaching activities**	15.1.	Lectures theoretical teaching	45
		15.2.	Exercises (laboratory, numerical, seminars, teamwork)	30

16.	**Other types of activities**	16.1.	Projects	10
		16.2.	Independent tasks	10
		16.3.	Homework and self-learning	55
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.	J.Park, J.Shore	Practical Dyeing	Society of Dyers and Colourists	2004
2.	A.D.Broadbent	Basic Principles of Textile Coloration	Society of Dyers and Colourists	2001
3.	W.Ingameles	Coloration of Textiles	Society of Dyers and Colourists	1003
4.				

22.2. Additional literature

No.	Author	Title	Publisher	Year
1.	W.Perkins	Textile Coloration and Finishing	Carolina Academic Press	1996
2.				
3.				