No. 13

| Course syllabus for First cycle studies | | | | | |
|---|---|---|---|---|---|
| 1. | **Course title** | Textile fibers 2 | | | |
| 2. | **Code** | CDE4M1 | | | |
| 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<br>3 semester | 7. | **Number of ECTS** | 6 |
| 8. | **Instructors** | Prof. Dr. Igor Jordanov | | | |
| 9. | **Prerequisites for course enrollment** | Textile fibers 1 (verfied) | | | |
| 10. | **Objectives of the course syllabus (competences):**<br>Students will gain a comprehensive understanding of the production, structure, properties, and applications of chemical fibers derived from natural polymers, as well as those made from synthetic polymers.<br><br>**Acquired skills (competences):** | | | | |
| 11. | **Content of the course:**<br>**Properties of Polymer Fibers**:<br>An in-depth exploration of the physical, chemical, and mechanical characteristics of polymer-based fibers, including strength, elasticity, moisture absorption, and durability.<br>**Stages of Chemical Fiber Production**:<br>A detailed overview of the various phases in the manufacturing process of chemical fibers, from polymer synthesis to fiber formation.<br>**Methods of Producing Chemical Fibers**:<br>An examination of the different techniques used to produce chemical fibers, including extrusion, spinning, and other specialized methods.<br>**Chemical Fibers from Natural Polymers**:<br>• **Regenerated Cellulose Fibers**: Fibers produced from natural cellulose through chemical processes, including viscose, lyocell, and cuprammonium fibers.<br>• **Modified Cellulose Fibers**: Fibers made by chemically altering cellulose, such as diacetate and triacetate fibers.<br>**Chemical Fibers from Synthetic Polymers**:<br>• **Polyamides (PA6, PA6.6, Aramid)**: The production and properties of polyamide fibers, including common types like PA6, PA6.6, and high-performance aramids.<br>• **Polyester (PET and Modified Polyesters)**: Polyester fibers, including standard PET and its various modified forms used in textiles.<br>• **Polyvinyl-based Fibers**: Fibers made from polyvinyl compounds such as polyacrylonitrile, polyvinyl chloride (PVC), polyvinylidene chloride, and polyvinyl alcohol (PVA). | | | | |

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<ul>
<li>Polyolefin Fibers: Fibers made from polyethylene (PE) and polypropylene (PP), focusing on their production and applications.</li>
<li>Polyurethane Fibers: An overview of fibers made from polyurethane, known for their elasticity and flexibility.</li>
<li>Glass Fibers: Properties and applications of fibers made from glass, highlighting their strength and resistance to heat and chemicals.</li>
</ul>
Fibers from Polymer Blends:<br>A study of fibers produced by blending different polymers to achieve enhanced or specialized properties for various applications.<br>High-Performance Fibers:<br>An exploration of advanced fibers designed for specialized industries, including aerospace, automotive, and protective wear, focusing on their exceptional strength, durability, and other unique attributes.
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<tr><td>12.</td><td colspan="5">Study methods: lectures and consultations, laboratory exercises, homework, home study (exam preparation)</td></tr>
<tr><td>13.</td><td colspan="2">Total available time</td><td colspan="3">210</td></tr>
<tr><td>14.</td><td colspan="2">Allocation of available time</td><td colspan="3"></td></tr>
<tr><td rowspan="2">15.</td><td colspan="2" rowspan="2">Teaching activities</td><td>15.1.</td><td>Lectures theoretical teaching</td><td>45</td></tr>
<tr><td>15.2.</td><td>Exercises ( laboratory, numerical, seminars, teamwork)</td><td>45</td></tr>
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<tr><td rowspan="3">16.</td><td colspan="2" rowspan="3">Other types of activities</td><td>16.1.</td><td>Projects</td><td>20</td></tr>
<tr><td>16.2.</td><td>Independent tasks</td><td>20</td></tr>
<tr><td>16.3.</td><td>Homework and self-learning</td><td>80</td></tr>
<tr><td rowspan="5">17.</td><td colspan="5">Grading system</td></tr>
<tr><td>17.1.</td><td colspan="3">Test</td><td>80 points</td></tr>
<tr><td>17.2.</td><td colspan="3">Successfully realized laboratory/auditory exercises</td><td>10 points</td></tr>
<tr><td>17.3.</td><td colspan="3">Individual work/homework</td><td>5 points</td></tr>
<tr><td>17.4</td><td colspan="3">Participation</td><td>5 points</td></tr>
<tr><td rowspan="6">18.</td><td colspan="2" rowspan="6">Grading criteria (points/grade)</td><td colspan="2">Up to 61 points</td><td>5 (five) (F)</td></tr>
<tr><td colspan="2">From 61 to 69 points</td><td>6 (six) (E)</td></tr>
<tr><td colspan="2">From 70 to 79 points</td><td>7 (seven) (D)</td></tr>
<tr><td colspan="2">from 80 to 89 points</td><td>8 (eight) (S)</td></tr>
<tr><td colspan="2">From 90 to 95 points</td><td>9 (nine) (B)</td></tr>
<tr><td colspan="2">from 95 to 100 points</td><td>10 (ten) (A)</td></tr>
<tr><td>19.</td><td colspan="2">Prerequisites for taking the final exam</td><td colspan="3">11 points minimum from 17.2 – 17.4</td></tr>
<tr><td>20.</td><td colspan="2">Language in which lectures are conducted</td><td colspan="3">English</td></tr>
<tr><td>21.</td><td colspan="2">Method for monitoring the quality of lectures</td><td colspan="3">Survey</td></tr>
<tr><td rowspan="3">22.</td><td colspan="5">LITERATURE</td></tr>
<tr><td rowspan="2">22.1.</td><td colspan="5">Compulsory literature</td></tr>
<tr><td>No.</td><td>Author</td><td>Title</td><td>Publisher</td><td>Year</td></tr>
</table>

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 1. | K. Ljapceva | Textile fibers | Teteks, Teplast | 2006 |
| | | 2. | I.Jordanov | Textile fibers | Internal script | 2010 |
| | | 3. | 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 |
| | 22.2. | Additional literature | | | | |
| | | No. | Author | Title | Publisher | Year |
| | | 1. | Cesare Andreoli Fabrizio Freti | Man-made fibers | ACIMIT Fondation | 2004 |
| | | 2. | Edited by Menachem Lewin | Handbook of fiber chemisty, third edition | CRC Press. Taylor and Francis group, New York | 2007 |
| | | 3. | | | | |