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| **Study program** Applied chemistry with the management basics |
| **Course title** Chemistry of textile materials and industrial dyes (H262C) |
| **Name of lecturer/lecturers** Milena M. Miljković |
| **Type of course** Elective |
| **Number of ECTS allocated** 7 |
| **Course objectives**It results from the constant growth of the production of natural and artificial textile fibers, i.e. textile fibers materials and finding new textile materials and fibers, which are the result of the latest knowledge from the field of chemistry. Getting to know the chemical structure and characteristics of textile materials, industrial dye, explaining the mechanism, the fundamental organic reactions that exactly lead to the synthesis of all known organic industrial dyes and their application in dyeing different substrates. |
| **Course outcomes**Acquiring knowledge about the chemical structure, properties and technological procedures of obtaining most oftenapplied natural and artificial textile fibers - materials. Getting to know the structure of industrial dyes, thermodynamics and kinetic laws that numerically define the key dyeing parameters of different materials. |
| **SYLLABUS***Lectures*Structure and classification of textile materials. Obtaining cellulose fibers. Getting protein fibers. Production of polyacrylonitrile fibers (PAN). Production of polyamide fibers (PA). Getting polyester fibers (PES). Obtaining acetate and triacetate fibers. Color structure and classification; Basic coloring theories. Chemical characteristics of cellulose fiber dyeing. Substantive, reducing, reactive, sulfurous, fiber-synthesized dyes. Theoretical principles of dyeing wool with acid, metal complex, chrome and reactive dyes. Chemical characteristics of dyeing synthetic fibers. Theoretical settings of dyeing polyacrylonitrile fibers. Theoretical settings of polyamide fiber dyeing. Theoretical settings of polyester fiber dyeing*Laboratory work*Pre-chemical treatment of cellulosic fibers and mixtures. Pre-chemical treatment of protein fibers and mixtures. Practical dyeing of cellulose fibers with direct dyes. Practical dyeing of cellulose fibers with reactive dyes. Practical dyeing of wool with acid dyes. Practical dyeing of wool with reactive dyes. Practical dyeing of wool with metal complex dyes. Practical dyeing of polyacrylonitrile fibers with disperse dyes. Practical dyeing of polyacrylonitrile fibers with cationic dyes. Practical dyeing of polyamide fibers with disperse dyes. Practical dyeing of polyamide fibers with acid dyes. Practical dyeing of polyester fibers with disperse dyes. |
| **References**1. M. Novaković, D. Džokić, S. Đorđević, Teorija i tehnologija oplemenjivanja tekstila hemijskom doradom, BMG, Beograd, 1998.
2. M. Novaković, Teorija i tehnologija oplemenjivanja tekstila bojenjem i štampanjem, BMG, Beograd, 1996.
3. D. Džokić, Teorija i tehnologija bojenja tekstilnog materijala, Tehnološko-metalurški fakultet Beograd, 1989.
4. W.S. Perkins, Textile Coloration and Finishing, Carolina Academic Press, 1996.
5. C. M. Carr, Chemistry of the Textiles Industry, Blackie Academic & Proffesional, 1995.
6. V. M. Ignjatović, S. Jovanović, Praktikum iz tehnologije bojenja tekstila, Tehnološki fakultet, Leskovac, 1995.
7. M. Ristić, Vlakna, Tehnološki fakultet, Banja Luka, 2000.
8. R. Čunko, E. Pezelj, Tekstilni materijali, Tekstilno-tehnološki fakultet, Zagreb, 2002.
9. R. S. Jovanović, Sintetizovana organska vlakna, Građevinksa knjiga, 1990.
10. A series of electronic teaching materials developed in the framework of ERASMUS+ NETCHEM project (http://mdl.netchem.ac.rs/course/view.php?id=72).
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| **Active teaching classes** | **Lectures** 45 | **Laboratory work** 30 |
| **Teaching mode**lectures, laboratory exercises, seminar papers, consultations**.** |
| **ASSESSMENT METHODS AND CRITERIA (Max 100 points)** |
| **Pre exam duties** | **Points** | **Final exam**  | **Points** |
| Activity during lectures | 5 | Written examination | 50 |
| Practical teaching | 10 | Oral examination | 20 |
| Teaching colloquia | 10 |  |  |
| Seminar | 5 |  |  |