



|  | | UNIVERSITY OF EAST SARAJEVO Faculty of Technology Zvornik | | | |  | | |
|---|--------------------|--|---|--------------------|----------------------|---|--|--|
| | | Study program: Chemical Engineering and Technology | | | | | | |
| | | I study cycle | | IV year of study | | | | |
| Course title | | HIGH PRESSURE TECHNOLOGY | | | | | | |
| Department | | Department for Process Engineering | | | | | | |
| Course code | | Status | | Semester | | ECTS | | |
| 04-2-048-7 | | Elective | | VII | | 3 | | |
| Teacher | | Vladan Mičić, PhD, full professor | | | | | | |
| Teaching Assistant | | Duško Kostić, MSc, assistant | | | | | | |
| Class fund/ teaching load (weekly) | | | Individual student workload (in semester hours) | | | Student load factor | | |
| Lectures | Auditory exercises | Laboratory exercises | Lectures | Auditory exercises | Laboratory exercises | S _o | | |
| 2 | 1 | 0 | 30 | 15 | 0 | 1.00 | | |
| total teaching load (in hours, per semester) 2*15 + 1*15 + 0*15 = 45 | | | total student workload (in hours, per semester) 2*15*1.00 + 1*15*1.00 + 0*15*1.00 = 45 | | | | | |
| Total course load (teaching + student): 45+ 45 = 90 semester hours | | | | | | | | |
| Learning outcomes | | <p>After finishing the course, students will:</p> <ol style="list-style-type: none"> 1. be acquainted with modern directions of development and application of condensed (near-critical and supercritical) fluids for the purpose of separation, chemical reaction or production of materials with special properties. 2. be able to perform theoretical settings and detailed analysis of various high-pressure processes realized in industrial conditions 3. master the techniques of application of supercritical fluids. | | | | | | |
| Prerequisites | | - | | | | | | |
| Teaching methods | | Lectures, exercises in the computer laboratory, consultations, seminar paper, mid-term tests/colloquia, exams. | | | | | | |
| Syllabus outline per week | | <ol style="list-style-type: none"> 1. Thermodynamic and mass transfer properties of compressed gases 2. Application of supercritical fluids in separation processes 3. Designing equipment for work at high pressures 4. Safety and control during the design and operation of plants at high pressure 5. Economic analysis of high pressure processes 6. Chemical reactions in supercritical solvents 7. Oxidation with supercritical water and application in industrial wastewater treatment 8. Mid-term test/Colloquium I 9. Supercritical fluid extraction and fractionation from solid materials 10. Polymerization at high pressure 11. Processing of pharmaceuticals with supercritical fluids 12. Treatment of microorganisms with high pressure 13. Dry cleaning with liquid carbon dioxide 14. Deposition of particles with densely packed gases 15. Mid-term test/Colloquium II | | | | | | |
| Mandatory literature | | | | | | | | |
| Author | | Title of publication, publisher | | | Year | Pages (from-to) | | |
| A. Bertucco, G. Vetter | | High Pressure Process Technology: Fundamentals and Applications, Elsevier | | | 2001 | 1-684 | | |
| Supplementary literature | | | | | | | | |
| Author | | Title of publication, publisher | | | Year | Pages (from-to) | | |
| R. Rohr, Ch. Trepp | | High Pressure Chemical Engineering, Elsevier | | | 1996 | 1-73 | | |
| G. Brunner | | Supercritical Fluids as Solvents and Reaction Media, Elsevier | | | 2004 | 39-84; 121-184; 533-616 | | |
| A. Duarte, C. Duarte | | Current Trends of Supercritical Fluid Technology in Pharmaceutical, Nutraceutical and Food Processing Industries, Bethman Books | | | | 1-97 | | |

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|---|--|---------------------|-------------------|
| R. Eldik, F. Klärner | High Pressure Chemistry: Synthetic, Mechanistic, and Supercritical Applications, Wiley - VCH | 2008 | 4-58 |
| Obligations, assessment methods and grading system | Type of student work evaluation | Grade points | Percentage |
| | Pre-exam obligations | | |
| | Attendance at lectures/exercises | 6 | 6 % |
| | Seminar paper | 24 | 24% |
| | Mid-term test/Colloquium 1 | 20 | 20% |
| | Mid-term test/Colloquium 2 | 20 | 20% |
| | Final exam | | |
| | Final exam | 30 | 30% |
| TOTAL | 100 | 100 % | |
| Web page | www.tfzv.ues.rs.ba | | |
| Date | 2023 | | |