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|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty of Technology** |  |
| **GENERAL INFORMATION** |
| Study program  | Material and energy flows management |
| Study Module (if applicable) | - |
| Course title | Sustainable development and renewable energy |
| Level of study | [ ] Bachelor [x]  Master’s [ ]  Doctoral |
| Type of course | [ ]  Obligatory [x]  Elective |
| Semester  | [ ]  Autumn [x] Spring |
| Year of study  | First |
| Number of ECTS allocated | 5 |
| Name of lecturer/lecturers | Prof. Olivera StamenkovićProf. Vlada Veljković |
| Teaching mode |  [x] Lectures [x] Group tutorials [x]  Individual tutorials [ ] Laboratory work [ ]  Project work [x]  Seminar [ ] Distance learning [ ]  Blended learning [ ]  Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| Students gain basic knowledge of the concept of sustainable development, become familiar with basic engineering principles methodologies for the implementation of sustainable development approaches. The aim of the course is that students master the principles of sustainable development, identify opportunities for its realization, and acquire the integrated knowledge about the impact of energy production and consumption on the environment and the principles of renewable energy development. Students are able themselves to apply the principles of sustainable development and to understand the processes used in renewable energy development. |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| Sustainable development - basic concepts, definitions of sustainable development. How sustainability evolved: underlying causes and effects. Linking sustainability and energy. The concepts of green chemistry, green engineering, and sustainability. The principles of green engineering as a foundation for sustainability. Twelve principles of green engineering with expanded analysis. The environment and sustainable development. Waste management. The assault on fresh water resources. Air quality. Climate change. Renewable energy: Choices, problems and opportunities. Fossil fuels depletion. Definition, types and cost of renewable energy. The impact of renewable energy use on the environmental. Principles of renewable energy. Solar energy. Hydro-power. Power from the wind. Tidal power. Biofuels. The energy of the biomass. Calculation of the operations and the processes used in utilization of renewable energy sources. |
| **LANGUAGE OF INSTRUCTION** |
| [ ] Serbian (complete course) [x]  English (complete course) [ ]  Other \_\_\_\_\_\_\_\_\_\_\_\_\_ (complete course)[ ] Serbian with English mentoring [ ] Serbian with other mentoring \_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **ASSESSMENT METHODS AND CRITERIA** |
| **Pre exam duties** | **Points** | **Final exam** | **points** |
| **Activity during lectures** | **10** | **Written examination** |  |
| **Test** | **20** | **Oral examination** | **40** |
| **Seminar work** | **30** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |