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|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty** | Faculty of Mechanical Engineering |
| **GENERAL INFORMATION** |
| Study program  | Mechanical Engineering |
| Study Module (if applicable) | Manufacturing & Information Technologies  |
| Course title | Knowledge Based Engineering Systems (KBES) |
| Level of study | ☐Bachelor ☐ Master’s × Doctoral |
| Type of course | ☐ Obligatory × Elective |
| Semester  | ×Autumn ☐Spring |
| Year of study  | Second |
| Number of ECTS allocated | 10 |
| Name of lecturer/lecturers | Dr Milos S Stojkovic |
| Teaching mode | ×Lectures ☐Group tutorials ☐ Individual tutorials☐Laboratory work ☐ Project work × Seminar☐Distance learning ☐ Blended learning ☐ Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| *Course aim: Provide student with the necessary level of knowledge about Knowledge Based Engineering Systems (KBES) in order to prepare him for future research and developments in the field.**Course outcome: After the course completing and passing the exam, the student will be able to:*1. *Identify the reasons and the pre-conditions for KBES application, define goals for a KBES,*
2. *Design elements of KBES, simulate and test their performance,*
3. *Apply techniques for applying KBES into the modern PLM system, in order to improve performance and to integrate complex production systems.*
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| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| 1. **Introduction – reasons and location of KBES application**
2. **Knowledge representation models (aimed for engineering systems),**
	1. **Models of formalized (strongly structured) knowledge,**
	2. **Models of non-formalized knowledge,**
	3. **Hybrid models of knowledge representation,**
3. **Models of computer aided reasoning (aimed for engineering systems)**
	1. **Causal Reasoning,**
	2. **Model-Based Reasoning,**
	3. **Case-Based Reasoning,**
	4. **Analogy Based Reasoning,**
	5. **The time context in reasoning process,**
	6. **Hybrid models of reasoning,**
4. **Models and methods for KBES application into the modern PLM systems (CAD/CAE/CAPP/CAM … systems),**
5. **5. Actual research challenges in the field.**
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| **LANGUAGE OF INSTRUCTION** |
| ×Serbian (complete course) × 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** |  | **Seminar paper (Written examination)** | **70** |
| **Practical teaching** |  | **Discussion (Oral examination)** | **30** |
| **Teaching colloquia** |  | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents***Realization of the seminar paper as well as regular attending to lectures are mandatory* |