|  |
| --- |
|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty** | Faculty of Mechanical Engineering |
| **GENERAL INFORMATION** |
| Study program  | **Mechanical Engineering** |
| Study Module (if applicable) | - |
| Course title | Optimal Synthesis of Mehanisms |
| Level of study | [ ] Bachelor [ ]  Master’s [x]  Doctoral |
| Type of course | [ ] Obligatory [x]  Elective |
| Semester  | [x] Autumn [ ] Spring |
| Year of study  | II |
| Number of ECTS allocated | 10 |
| Name of lecturer/lecturers | Nenad D. Pavlović |
| Teaching mode | [x] Lectures [ ] Group tutorials [x] Individual tutorials[ ] Laboratory work [x] Project work [ ] Seminar[ ] Distance learning[ ] Blended learning[ ] Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| The purpose of this course is to gain some advanced knowledge for synthesis of new or improved mechanisms of machines and devices. Students should gain the ability to analyse complex planar or spatial linkages and to synthesize improved mechanisms of machines and devices using optimization techniques - optimization problem formulation, constraints identification, suitable optimization algorithm selection and optimization of given synthesis problem using MATLAB (Toolbox Optimization). |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| **Analysis of Complex Linkages*** + Analysis of Complex Planar Linkages
	+ Analysis of Spatial Linkages.

**High Ratios Speed reducers*** + Cycloidal Drive
	+ Strain Wave Gearing (Harmonic Drive).

**Linkage Synthesis*** + Type and Number Synthesis;
	+ Analytical Dimensional Synthesis (Function Generation, Motion Generation, Path Generation with Prescribed Timing).

**Optimal Synthesis of Mechanisms*** + Optimization Problem Formulation
	+ Unconstrained Optimization
	+ Constrained Optimization
	+ Classical Optimization Algorithms
	+ Analysis and Optimization of the Effect of Manufacturing Tolerances on the Mechanism Accuracy.
 |
| **LANGUAGE OF INSTRUCTION** |
| [x] Serbian (complete course) [x] English (complete course) [x] German (complete course)[ ] Serbian with English mentoring [ ] Serbian with other mentoring \_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **ASSESSMENT METHODS AND CRITERIA** |
| **Pre exam duties** | **Points** | **Final exam** | **points** |
| **Activity during lectures** |  | **Written examination** |  |
| **Practical teaching** |  | **Oral examination** | **Max. 30** |
| **3 term papers** | **3x25=75** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |