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|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty**  | Faculty of Science and Mathematics |
| **GENERAL INFORMATION** |
| Study program  | **Computer Science** |
| Study Module (if applicable) | Software development |
| Course title | Decision Theory |
| Level of study | [ ] Bachelor [x]  Master’s [ ]  Doctoral |
| Type of course | [ ]  Obligatory [x]  Elective |
| Semester  |  [ ]  Autumn [x] Spring |
| Year of study  | I |
| Number of ECTS allocated | 8 |
| Name of lecturer/lecturers | Ivan Stanimirović |
| Teaching mode |  [x] Lectures [ ] Group tutorials [x]  Individual tutorials [x] Laboratory work [ ]  Project work [ ]  Seminar [ ] Distance learning [ ]  Blended learning [ ]  Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| *Focus on the foundations and philosophical applications of Bayesian decision theory, game theory, and the theory of collective choice. We are interested in general questions about the nature of practical rationality, contrasting interpretations of probability and of utility, the status of the principle of expected utility, with the application of these concepts to the study of the interaction of different rational agents in competitive and cooperative situations, and with the relationship between individual values and the values of groups, institutions and societies. We will try to connect an examination of the basic concepts of Bayesian decision theory with philosophical questions about the nature of action, personal identity, deliberation and responsibility, and an examination of the basic concepts of game theory and social choice theory with philosophical questions about the interaction of epistemic and causal concepts, individual and group decision making.* |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| I. Individual decision theory* Preference, ignorance and risk
* Probability – subjective and objective
* Utility and value
* Causal decision theory

II. Game theory* The basic framework
* Nash Equilibrium and other solution concepts
* Game theory and individual decision theory
* Coordination games, bargaining and negotiation

III. Theory of collective choice* Defining social value in terms of individual value
* Arrow's theorem, and other impossibility results
* Interpersonal comparisons of utility
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| **LANGUAGE OF INSTRUCTION** |
| [x] Serbian (complete course) [ ]  English (complete course) [ ]  Other \_\_\_\_\_\_\_\_\_\_\_\_\_ (complete course)[x] 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** | **30** |
| **Practical teaching** | **0** | **Oral examination** | **40** |
| **Teaching colloquia** | **20** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |