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| Course: | **DECISION-MAKING IN WATER RESOURCES** |
| Course id: |
| Number of ECTS: 4 |
| Teacher: | Bojan Srdjevic, Zorica Srdjevic, Christos Karavitis |
| Course status | Elective |
| Number of active teaching classes (weekly) |
| Lectures:3 | Practical classes:3 | Other teaching types: | Study research work: | Other classes: |
| Precondition courses | Basics in mathematics, IT skills |
| 1. Educational goal

The topic will give a deeper understanding and an introduction to application of decision-making theory and its instruments in water resources planning and management. |
| 1. Educational outcomes

On successful completion of this subject, the students should: a) have acquired understanding of systems analysis approach to modeling of agricultural water systems; b) have acquired basic knowledge of a number of decision making methods and tools; c) be able to make appropriate and critical use of these methods and tools for a variety of water related problems; d) be able to identify suitable methods and tools for solving allocation problems; e) be able to critically assess research results; f) improve skills for independent learning, reporting and presentation; g) improve IT skills. |
| 1. Course content

**Introduction to the decision-making**: decisions and consequences; structuring decision problems; decision elements – goal, criteria set and alternative set; well and ill-structured problems. **Weak optimization**: single and multiple criteria approach; multi-criteria analysis; procedures and supporting systems, techniques and generators; decision-making with certainty and uncertainty. **Outranking methods**: Analytic hierarchy process (AHP); Ideal-point methods. **Instruments, mechanisms and methodologies in intelligent decision-making**: overview, advantages and shortcomings of heuristic and meta-heuristic techniques. **Social theory (elective) methods**: Borda, Hare, approval voting; linking with standard multi-criteria decision-making methods; applications. **Individual and group decision-making**:complete and incomplete information, aggregation techniques. **Multi-criteria methods and optimization in agriculture and water related problems**: Practical implementation, case studies |
| 1. Teaching methods

Lectures and exercises. Students will accomplish a semester project and present results in oral and in writing. The work counts for 60% of the final grade. The lectures are held in English. Retake exams may be oral only. |
| Knowledge evaluation (maximum 100 points) |
| Pre-examination obligations | Mandatory | Points | Final exam | Mandatory | Points |
| Assignments | Yes | 60 | Written and Oral | Yes | 40 |
| Literature  |
| Ord. | Author | Title | Publisher | Year |
|  | Brans J.P. and Mareschal B.  | PROMCALC & GAIA: A New Decision Support System for Multicriteria Decision Aid | Decision Support Systems, 12, 297-310 | 1994 |
|  | Saaty T.  | The Analytic Hierarchy Process, | McGraw Hill. | 1980 |
|  | Srdjevic B.  | Systems Analysis Methods in Engineering With Extensions in Environmental Engineering | Federal University of Bahia, Salvador, Brazil.  | 2003 |
| 4. | Srdjevic B., Medeiros Y.D.P., and Faria A.S.  | An Objective Multi-criteria Evaluation of Water Management Scenarios | International Journal of Water Resources Management, 18 (1), 65-84, Kluwer | 2004 |
| 5. |  |  | Internet sources (articles, reports, presentations) |  |

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| Znak univerziteta | UNIVERSITY OF NOVI SADFACULTY OF AGRICULTURE 21000 NOVI SAD, TRG DOSITEJA OBRADOVIĆA 8 | Znak fakulteta2 |
| Study Programme AccreditationMASTER ACADEMIC STUDIES - AGRICULTURAL WATER MANAGEMENT (LOLAqua) |
| Table 5.2 Course specification |