Predmet:	Podpora pri odločanju
Course title:	Decision Support

Študijski program in stopnja Study programme and level	Modul Module	Letnik Academic year	Semester Semester
Informacijske in komunikacijske tehnologije, 3. stopnja	Tehnologije znanja	1	1
Information and Communication Technologies, 3rd cycle	Knowledge Technologies	1	1

Vrsta predmeta / Course type

Izbirni / Elective

Univerzitetna koda predmeta / University course code:

IKT3-718

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Laboratory work	Druge oblike	Samost. delo Individ. work	ECTS
15	15			15	105	5

*Navedena porazdelitev ur velja, če je vpisanih vsaj 15 študentov. Drugače se obseg izvedbe kontaktnih ur sorazmerno zmanjša in prenese v samostojno delo. / This distribution of hours is valid if at least 15 students are enrolled. Otherwise the contact hours are linearly reduced and transfered to individual work.

Nosilec predmeta / Lecturer:

Prof. dr. Marko Bohanec
Prof. dr. Bojan Cestnik

Jeziki / **Languages:**	**Predavanja / Lectures:**	slovenščina, angleščina / Slovenian, English
	Vaje / Tutorial:	

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Prerequisits:

Zaključen študij druge stopnje s področja informacijskih ali komunikacijskih tehnologij ali zaključen študij druge stopnje na drugih področjih z znanjem osnov s področja predmeta. Potrebna so tudi osnovna znanja matematike, računalništva in informatike.

Completed second cycle studies in information or communication technologies or completed second cycle studies in other fields with knowledge of fundamentals in the field of this course. Basic knowledge of mathematics, computer science and informatics is also requested.

Vsebina:

Content (Syllabus outline):

Uvod:
  odločanje in podpora pri odločanju, odločitveni proces, komponente odločanja, vrste odločanja, discipline, ki se ukvarjajo z odločanjem
Odločitvena analiza:
  metode in tehnike modeliranja v odločitveni analizi, odločanje v pogojih negotovosti in s tveganjem, odločitvene tabele, odločitvena drevesa, diagrami vpliva, večkriterijski modeli,

Introduction:
  decision making and decision support, decision process, components of decision making, taxonomy of decisions, disciplines related to decision making
Decision analysis:
  modeling methods and techniques of decision analysis, decision making under risk and uncertainty, decision tables, decision trees, influence diagrams, multi-criteria models,

izbrane metode večkriterijskega modeliranja; Kepner-Tregoe, MAUT, AHP, DEX, TOPSIS, PROMETHEE, UTA

Napredne metode odločitvenega modeliranja: integracija odločitvenih dreves, diagramov vpliva in večkriterijskih modelov, integracija metod analize podatkov in odločitvenega modeliranja, integracija kvalitativnega in kvantitativnega modeliranja, verjetnostno modeliranje in modeliranje zaupanja, agregacijske funkcije, revizija odločitvenih modelov

Praktično usposabljanje: praktična uporaba izbranih tehnik in orodij za podporo pri odločanju

selected multi-criteria modeling methods: Kepner-Tregoe, MAUT, AHP, DEX, TOPSIS, PROMETHEE, UTA

Advanced decision modeling methods: integration of decision trees, influence diagrams and multi-criteria models, integration of data mining and decision modeling, integration of qualitative and quantitative modelling, probabilistic and confidence modelling, aggregation functions, decision model revision

Practical training: practical use of selected decision support techniques and tools

Temeljni literatura in viri / Readings:

Izbrana poglavja iz naslednjih knjig: / Selected chapters from the following books:

- Greco, S., Ehrgott, M., Figueira, J.: *Multiple Criteria Decision Analysis: State of the Art Surveys*. Springer, 2016. ISBN 978-1-4939-3094-4
- A. Ishizaka, and P. Nemery, *Multi-criteria Decision Analysis: Methods and Software*. Wiley, 2013. ISBN: 978-1-119-97407-9
- Bouyssou, D., Marchant, T., Pirlot, M., Tsoukias, A., Vincke, P.: *Evaluation and Decision Models with Multiple Criteria: Stepping Stones for the Analyst*. International Series in Operations Research and Management Science, Volume 86. Boston: Springer, 2006. ISBN 978-0-387-31099-2
- D. Mladenić, N. Lavrač, M. Bohanec, and S. Moyle, Eds. *Data Mining and Decision Support: Integration and Collaboration*. Kluwer 2003. ISBN 1-4020-7388-7
- M. Bohanec: *Odločanje in modeli*. DMFA - založništvo, 1. ponatis, 2012. ISBN 978-961-212-190-7
- Bohanec, M.: DEXi: *Program for Multi-Attribute Decision Making, User's Manual*, Version 5.00. IJS Report DP-11897, Jožef Stefan Institute, Ljubljana, 2015.

Cilji in kompetence:

Cilj predmeta je spoznati napredne metode, tehnike in sisteme za podporo zahtevnih realnih odločitvenih problemov.

Poudarek je na spoznavanju in obvladovanju naprednih metod odločitvene analize in večkriterijskega modeliranja ter na njihovi uporabi v praksi pri reševanju zahtevnih odločitvenih problemov.

Objectives and competences:

The aim of this course is to learn advanced methods, techniques and systems for supporting complex real-life decision-making tasks.

Special emphasis is on learning and mastering advanced methods of decision analysis and multi-criteria modeling, and their practical applications for solving complex decision problems.

Predvideni študijski rezultati:

Študenti bodo z uspešno opravljenimi obveznostmi tega predmeta pridobili:
- razumevanje konceptov odločanja, odločitvenih procesov in sistemov za podporo pri odločanju
- razumevanje različnih odločitvenih nalog in različnih vrst odločitvenih problemov

Intended learning outcomes:

Students successfully completing this course will acquire:
- understanding the concepts of decision making, decision processes and decision support systems
- understanding of various decision tasks and categories of decision problems

znanja o pristopih odločitvene analize in razumevanje metod odločitvenega modeliranja	understanding the approaches of decision analysis and decision modeling
veščine izdelave odločitvenega modela in njegove uporabe za reševanje realnega odločitvenega problema	the ability to identify decision problems and specify its properties and components
osnovne veščine uporabe računalniške programske opreme za podporo pri odločanju	the ability to develop and apply a decision model in real-life decision problems
	basic skills for using decision support and decision modeling software

Metode poučevanja in učenja:

Predavanja, seminar, konzultacije, samostojno delo

Learning and teaching methods:

Lectures, seminar, consultancy, individual work

Načini ocenjevanja:	Delež (v %) / Weight (in %)	Assessment:
Pisni ali ustni izpit	50 %	Written or oral exam
Seminarska naloga	25 %	Seminar work
Ustni zagovor seminarske naloge	25 %	Oral defense of the seminar work

Reference nosilca / Lecturer's references:

- **M. Bohanec,** Odločanje in modeli: 1. ponatis. DMFA - založništvo, 2012. ISBN 961-212-190-7
- **M. Bohanec**, V. Rajkovič, I. Bratko, B. Zupan, and M. Žnidaršič: DEX methodology: Three decades of qualitative multi-attribute modelling. *Informatica 37*, 49-54, 2013.
- Trdin, N., **Bohanec, M.**: Extending the multi-criteria decision making method DEX with numeric attributes, value distributions and relational models. *Central European Journal of Operations Research*, 1-24, 2018.
- **B. Cestnik,** T. Urbančič, and I. Petrič: Ontological representations for supporting learning in business communities. In: Smrikarov, A. (ur.). e-Learning'11 : Proceedigs of the International Conference on e-Learning and the Knowledge Society, 25-26 August 2011, Bucharest, Romania. Bucharest: ASE Publishing House, 2011, pp. 260-265.
- **B. Cestnik,** N. Lavrač, F. Železny, D. Gamberger, L. Todorovski, and M. Kline: Data mining for decision support in marketing: a case study in targeting a marketing campaign. In: **M. Bohanec** (ed.), B. Kavšek (ed.), N. Lavrač (ed.), D. Mladenič (ed.). ECML/PKDD-2002 Workshop [Proceedings]: IDDM-2002. Helsinki: Helsinki University, 25-34, 2002.