

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet: Odločitveni modeli, sistemi za podporo odločanju
Course title: Decision models, Decision Support Systems

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Kibernetska varnost, magistrski študijski program druge stopnje	-	Prvi	Drugi
Cyber Security, second cycle Masters Study Programme	-	First	Second

Vrsta predmeta / Course type

Izbirni / Elective

Univerzitetna koda predmeta / University course code:

5-KV-MAG-IP-OMSPO-2021-12-14

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
30	-	20	-	-	100	5

Nosilec predmeta / Lecturer:

izr. prof. dr. Blaž Rodič

Jeziki / Languages:**Predavanja / Lectures:** slovenski, angleški / Slovene, English**Vaje / Tutorial:** slovenski, angleški / Slovene, English**Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:**

Študent/študentka mora pred pristopom k izpitu pripraviti in zagovarjati empirično seminarsko nalogo.

Prerequisites:

Prior to the exam, the student has to prepare and present seminar work.

Vsebina:

- Uvod v predmet; namen študija predmeta, povezanost predmeta z drugimi predmeti, vsebina študija predmeta, študijska literatura;
- Podatek, informacija, znanje, vrste podatkov, lastnosti informacije;
- Odločitveni proces: komponente odločanja, faze odločitvenega procesa, modeliranje odločanja;
- Metode odločanja v negotovosti in s tveganjem,

Content (Syllabus outline):

- Introduction to the course; the purpose of the study course, the relationship of the object with other objects, the contents of the study course, literature;
- Data, information, knowledge, data types, attributes of information;
- Decision process: components, phases of the decision process, decision modelling;

<ul style="list-style-type: none"> • Metode odločanja: odločitvena matrika, odločitvena drevesa, diagrami vpliva; • Sistemi za podporo odločanja, strukturirani in nestrukturirani podatkovni viri za poslovno odločanje, skupinsko odločanje, funkcije koristnosti • Oris simulacijskih metodologij (DES, SD; ABM; druge metode); • Zvezna simulacija in sistemska dinamika; pregled orodij; primeri; • Diskretna ali dogodkovno orientirana simulacija; pregled orodij; primeri • Praktični primeri odločitvenih modelov. 	<ul style="list-style-type: none"> • Decision methods for decision making under uncertainty and with risk, • Decision methods: decision matrix, decision trees, diagrams of influence; • Decision support systems, structured and unstructured data sources for business decision-making, group decision making, utility functions; • Outline of simulation methodologies (DES, SD; ABM; other methods); • Continuous simulation and system dynamics; overview of tools; examples; • Discrete or event-oriented simulation; overview of tools; examples; • Decision model examples.
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Temeljni literatura in viri / Readings:

<ul style="list-style-type: none"> • Howard, R. A. and A. E. Abbas. Foundations of Decision Analysis, Prentice Hall, NY, 2016. • Sharda, R., Delen, D., Turban, E., Business Intelligence and Analytics: Systems for Decision Support, 10th Edition, Pearson, 2015. • Borschchev A. (2013) The Big Book of Simulation Modeling. Multimethod Modeling with AnyLogic 6, AnyLogic North America • Bohanec, M.: Odločanje in modeli, DMFA Založništvo, Ljubljana 2006. • Hammond, J.S., Keeney, R.L., Raiffa, H., Pametne odločitve: praktični vodnik za sprejemanje boljših odločitev, Gospodarski vestnik, Ljubljana, 2004.
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Cilji in kompetence:

<p>Cilji: Glavni cilj predmeta je seznaniti slušatelje s področjem uporabe odločitvenih modelov ter dogodkovne simulacije in sistemske dinamike pri reševanju odločitvenih problemov</p> <p><i>Učna enota prispeva k razvoju naslednjih splošnih kompetenc:</i></p> <ul style="list-style-type: none"> • Razumevanje pomena kibernetске varnosti; • Sposobnost pridobivanja, selekcije, analize informacij in zmožnost njihove interpretacije za celovito reševanje problemov, izzivov in incidentov s področja kibernetске varnosti. • Poznavanje uveljavljenih metodoloških pristopov za

Objectives and competences:

<p>Objectives: Courses main objective is to introduce the application of decision models and discrete simulation and system dynamics at solving of the decision problems</p> <p><i>The instructional unit contributes to the development of the following general competences:</i></p> <ul style="list-style-type: none"> • Understanding the importance of cyber security; • The ability to obtain, select, analyze information, as well as to interpret them to comprehensively solve problems, challenges and incidents in the field of cyber security; • Knowledge of established methodological approaches for security management of modern information systems and networks.
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upravljanje varnosti sodobnih informacijskih sistemov in omrežij.

in predmetno-specifične kompetence:

- Obvladovanje metod izdelave večkriterijskih odločitvenih modelov.
- Znanje modeliranja odločitvenih procesov.
- Sposobnost za izvajanje ali podporo pri sprejemanju odločitev v okviru negotovosti.
- Poznavanje in obvladovanje simulacijskih metod in orodij za podporo odločanju.

and subject-specific competences:

- Proficiency in methods for design of multi-criteria decision models;
- Decision process modelling skills;
- Ability to make decisions or support decision making under uncertainty;
- Knowledge and ability to use simulation methods and tools for decision support.

Predvideni študijski rezultati:

Znanje in razumevanje:

Študent/študentka ima/obvlada:

- poznavanje elementov odločitvenega procesa;
- poznavanje metod razvoja odločitvenih modelov;
- poznavanje dobrih in slabih strani obstoječih metod in tehnik za podporo odločitvam;
- poznavanje mesta in vloge sodobnih pripomočkov za podporo odločitvenim procesom;
- uporaba simulacijskih modelov kot podporo odločanju.

Intended learning outcomes:

Knowledge and understanding:

Students have/master the:

- knowledge of the elements of the decision-making process;
- knowledge of methods development of decision models;
- knowledge of the strengths and weaknesses of existing methods and techniques to support decisions;
- knowledge of place and role of modern tools to support decision-process;
- usage of simulation models for decision support.

Metode poučevanja in učenja:

- *Predavanja* z aktivno udeležbo študentov (razlaga snovi, pogovori, vprašanja, primeri, reševanje problemov);
- *Laboratorijske vaje* (večkriterijsko odločanje, podpora odločanju, modeliranje in simulacija);
- *Individualno delo*; študij znanstvene in strokovne literature in priprava empirične seminarske naloge.

Learning and teaching methods:

- *Lectures* with the active participation of students (presentation, discussion, questions, problems, problem solving);
- *Laboratory exercises* (multi-criteria modelling, decision modelling, simulation modelling);
- *Individual work*: study of scientific and professional literature and development of empirical seminar work

Načini ocenjevanja:

Delež (v %) /

Weight (in %) **Assessment:**

Način (pisni izpit, ustno izpraševanje, naloge, projekt):		Type (examination, oral, coursework, project):
<ul style="list-style-type: none"> • pisni izpit • empirična seminarska naloga 	<p>50</p> <p>50</p>	<ul style="list-style-type: none"> • written exam • empirical seminar work

Reference nosilca / Lecturer's references:

<ul style="list-style-type: none"> • RODIČ, Blaž. Industry 4.0 and the new simulation modelling paradigm. Organizacija : revija za management, informatiko in kadre, ISSN 1318-5454. [Tiskana izd.], aug. 2017, vol. 50, no. 3, str. 193-207, ilustr., doi: 10.1515/orga-2017-0017 • BRELIH, Marjan, RAJKOVIČ, Uroš, RUŽIČ, Tomaž, RODIČ, Blaž, KOZELJ, Daniel. Modelling decision knowledge for the evaluation of water management investment projects. Central European Journal of Operations Research, ISSN 1435-246X, 2018, vol. , iss. , str. https://link.springer.com/content/pdf/10.1007%2Fs10100-018-0600-5.pdf, doi: 10.1007/s10100-018-0600-5. • KANDUČ, Tadej, RODIČ, Blaž. Optimisation of machine layout using a force generated graph algorithm and simulated annealing. International journal of simulation modelling, ISSN 1726-4529, 2016, vol. 15, no. 2, str. 275-287. • RODIČ, Blaž, BAGGIA, Alenka. Dynamic airport ground crew scheduling using a heuristic scheduling algorithm. International journal of applied mathematics and informatics, ISSN 2074-1278, 2013, vol. 7, iss. 4, str. 153-163. • RODIČ, Blaž. Mobile agents for distributed decision support systems. The International Scientific Journal of Management Information Systems, ISSN 1452-774X, 2011, vol. 6, no. 1, str. 20-27. • RODIČ, Blaž, KLJAJIĆ, Mirosljub. Accessing distributed data sources with mobile agents and XML. V: JAŠKOVÁ, Mária (ur.). ECON '05 : [selected research papers], (Research works proceedings, ISSN 0862-7908, Vol. 12, 2005). Ostrava: Technical University of Ostrava, Faculty of Economics. 2005, str. 280-287. • RODIČ, Blaž, KLJAJIĆ, Mirosljub. Integracija simulacijskih orodij v e-poslovni informacijski sistem. V: GRIČAR, Jože (ur.). Izboljšanje konkurenčnosti regije z e-poslovanjem, (Organizacija, ISSN 1318-5454, Letn. 37, 2004, št. 3). Kranj: Moderna organizacija. 2004, str. 162-167. • ŠKRABA, Andrej, BAGGIA, Alenka, RODIČ, Blaž. Application of a group decision support system in the reform of study programmes. V: DONDON, Philippe (ur.). Recent advances in education and modern educational technologies, (Educational technologies series, 9). [S. l.: s. n.]. 2013, str. 128-134. • RODIČ, Blaž. Issues of e-collaboration and knowledge management in media industries. V: LUGMAYR, Artur (ur.), et al. Information systems and management in media and entertainment industries, (International series on computer entertainment and media technology (Online), ISSN 2364-9488). Cham: Springer. cop. 2016.
