

NAME OF THE COURSE	ARTIFICIAL INTELLIGENCE IN KINESIOLOGY & SPORT (Eng)					
Code		Year of study	1st			
Course teacher	Full Professor Dražen Čular, PhD	Credits (ECTS)	3 ECTS			
Associate teachers	Dino Belošević, PhD	Type of instruction (number of hours per semester)	L	S	E	F
			30	15	-	-
Status of the course	Elective	Percentage of application of e-learning	20 %			
COURSE DESCRIPTION						
Course objectives	To introduce the methodological approach to the students and to equip them with the basic knowledge and skills necessary for use and application of artificial intelligence (AI) in the field of sport science.					
Course enrolment requirements and entry competences	No requirements.					
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul style="list-style-type: none"> - Explain the basic concepts and principles of artificial intelligence in the context of sport science. - Identify and evaluate appropriate AI techniques for sports performance analysis and prediction. - Apply AI algorithms and models to optimize training programs and enhance performance in sport science. - Utilize AI-based systems for athlete management and injury prevention in sport science. - Discuss and analyze the ethical considerations and challenges related to AI in sport science. 					
Course content broken down in detail by weekly class schedule	Theme	Course content (lectures)	Number of hours			
	1.	Introduction to Artificial Intelligence in Sport Science	2			
	2.	Basics of Machine Learning and Deep Learning for Sport Science	2			
	3.	Data Collection and Preprocessing in Sport Science	3			
	4.	Supervised Learning Techniques for Sports Performance Analysis	3			
	5.	Reinforcement Learning in Sport Science: Optimizing Training and Decision-Making	3			
	6.	Computer Vision Applications in Sport Science: Action Recognition and Tracking	3			

	7.	AI-Based Systems for Athlete Performance Monitoring and Injury Prediction	3			
	8.	Ethical Considerations in AI Research in Sport Science	2			
	9.	AI-Integrated Sports Technology: Wearables, Sensors, and Internet of Things (IoT)	3			
	10.	AI in Sports Performance Evaluation and Scouting	3			
	11.	Future Trends and Directions in AI for Sport Science	3			
	Theme	Course content (seminars)	Number of hours			
	1.	Applications of AI in Sports Performance Analysis	1			
	2.	AI-Based Training Program Optimization in Different Sports	1			
	3.	Computer Vision Techniques in Action Recognition and Tracking	1			
	4.	NLP Applications in Sports Data Analysis and Sentiment Classification	1			
	5.	Ethical Challenges in AI-Based Athlete Monitoring and Data Privacy	1			
	6.	AI Integration with Sports Technology: Challenges and Opportunities	2			
7	Seminars & Presentations	8				
Format of Instruction	x lectures x seminars and workshops <input type="checkbox"/> exercises <input type="checkbox"/> on line in entirety x partial e-learning <input type="checkbox"/> field work	x independent assignments x multimedia <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)				
Student responsibilities	Regular attendance					
Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	1	Research		Practical training	
	Experimental work		Report		(Other)	
	Essay		Seminar essay	1	(Other)	
	Preliminary exam		Oral exam	1	(Other)	
	Written exam		Project		(Other)	
Grading and	The final grade for the course is determined based on the points achieved in: → Class attendance and commitment – up to 20 points					

evaluating student work in class and at the final exam	<p>→ Seminar paper form – up to 40 points</p> <p>→ Oral exam (Seminar presentation) – up to 40 points</p> <p>During the course, a student can achieve 100 points. Class attendance and commitment (up to 20 points) are evaluated. Evaluation of knowledge is done based on the seminar essay (up to 40 points) and the Oral exam - seminar presentation (up to 40 points). The final grade is given at the end of the course.</p> <p>Students who achieve at least 40 points during the classes (class attendance and commitment + seminar essay) can attend Oral exam - present seminar. The final grade is determined by summing up all the points according to the following criterion: >80= excellent (5), 76-80=very good (4), 71-75= good (3), 61-70= sufficient (2), <60 = insufficient (1).</p>
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Required literature (available in the library and via other media)	Title	Number of copies in the library	Availability via other media
	Čular, Dražen, Šamija, Krešimir, Sporiš, Goran, How to prepare, write and publish scientific article in kinesiology and sport, / Čular, Dražen; Šamija Krešimir, Sporiš, Goran; Ana Kezić, (Ed.). Split, University of Split Faculty of Kinesiology, 2020. (University textbook in English language – digital publication)		moodle.kifst.hr
	Claudino, J. G., Capanema, D. D. O., de Souza, T. V., Serrão, J. C., Machado Pereira, A. C., & Nassis, G. P. (2019). Current approaches to the use of artificial intelligence for injury risk assessment and performance prediction in team sports: a systematic review. <i>Sports medicine-open</i> , 5, 1-12		https://link.springer.com/article/10.1186/s40798-019-0202-3
	Nadikattu, R. R. (2020). Implementation of new ways of artificial intelligence in sports. <i>Journal of Xidian University</i> , 14(5), 5983-5997.		file:///Users/mac/Dropbox/Mac%20(3)/Downloads/SSRN-id3620017.pdf
	McCabe, A., & Trevathan, J. (2008, April). Artificial intelligence in sports prediction. In <i>Fifth International Conference on Information Technology: New Generations (itng 2008)</i> (pp. 1194-1197). IEEE.		https://ieeexplore.ieee.org/abstract/document/4492661
	LI, Bin & XU, Xinyang. Application of Artificial Intelligence in Basketball Sport. <i>Journal of Education, Health and Sport</i> [online]. 8 July 2021, T. 11, nr 7, s. 54–67. [accessed 15.5.2023]. DOI 10.12775/JEHS.2021.11.07.005		https://apcz.umk.pl/JEHS/article/view/JEHS.2021.11.07.005
	Ding, P. (2019, August). Analysis of artificial intelligence (AI) application in sports. In <i>Journal of Physics: Conference Series</i> (Vol. 1302, No. 3, p. 032044). IOP Publishing.		https://iopscience.iop.org/article/10.1088/1742-6596/1302/3/032044/meta
	Lee, H. S., & Lee, J. (2021). Applying artificial intelligence in physical education and future		https://www.mdpi.com/2071-1050/13/1/351

	perspectives. <i>Sustainability</i> , 13(1), 351.		
	de la Torre, R., Calvet, L. O., Lopez-Lopez, D., Juan, A. A., & Hatami, S. (2022). Business Analytics in Sport Talent Acquisition: Methods, Experiences, and Open Research Opportunities. <i>International Journal of Business Analytics (IJBAN)</i> , 9(1), 1-20		https://upcommons.upc.edu/bitstream/handle/2117/384537/Business.pdf?sequence=3
	Materials uploaded on Moodle (Croatian and English language)		moodle.kifst.hr
Optional literature			
Quality assurance methods that ensure the acquisition of exit competences	Class attendance, seminar essay, students' evaluation of the course and the teacher		
Other (as the proposer wishes to add)	The course can be held in English and Croatian language, it can be enrolled by KIFST students and students from other faculties of the University of Split, as well as Erasmus students.		