

TRUNAME OF THE COURSE		Structural equation modeling in economics and business					
Code	EUAD04		Year of study		2nd year of graduate studies (winter semester)		
Course teacher	Assistant Professor Marija Vuković, PhD Professor Snježana Pivac, PhD		Credits (ECTS)		5		
Associate teachers		Type of instruction (number of hours)	L	S	E	F	
			26		26		
Status of the course	elective	Percentage of application of e-learning	40%				
COURSE DESCRIPTION							
Course objectives	- Provide students with advanced knowledge of different approaches to structural equation modeling (SEM), their basics and advanced techniques, with a special emphasis on application in economics. - Develop students' skills and abilities to recognize when to use SEM in their own analyses, how to create and test models, and interpret results in the context of economic and business research. - To provide and develop students' knowledge and abilities in the use of appropriate specialized software tools for the implementation of SEM.						
Course enrolment requirements and entry competences required for the course	There are no prerequisites for enrolment. Students of all graduate studies at FEBT can enrol this elective course.						
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Main learning outcome of the course: To conclude on the adequacy of the use of the SEM method, to apply SEM to real data collected through own research, and to critically analyze and interpret the results of SEM analysis in the context of economic research. Individual learning outcomes: 1. Explain the fundamental concepts and theoretical background of structural equation modeling. 2. Based on theoretical assumptions, design and test an appropriate SEM model for economic research purposes. 3. Apply SEM to real-world data from the field of economics. 4. Critically evaluate and interpret the results of SEM analyses.						
Course content broken down in detail by weekly class schedule (syllabus)	Lectures		Exercises				
	Topic	Hours	Topic	Hours			
	Exploratory factor analysis	2	Exploratory factor analysis.	2			
	Introduction to structural equation modeling. Latent variables in economics.	2	Introduction to structural equation modeling. Latent variables in economics.	2			
	Model specification and identification. Estimation methods.	2	Practical example of SEM model construction.	2			
	Analysis of statistical assumptions for model testing.	2	Analysis of statistical assumptions for model testing.	2			

	Confirmatory factor analysis. Measurement model analysis.	2	Confirmatory factor analysis. Measurement model analysis.	2		
	Structural model analysis.	2	Structural model analysis.	2		
	Introduction to PLS-SEM. Differences between PLS-SEM and CB-SEM. Advantages and applications of PLS-SEM.	2	Practical example of PLS-SEM model construction.	2		
	Reflective measurement model analysis.	2	Reflective measurement model analysis.	2		
	Formative measurement model analysis.	2	Formative measurement model analysis.	2		
	PLS-SEM structural model analysis. Predictive relevance of the model.	2	PLS-SEM structural model analysis. Predictive relevance of the model.	2		
	Mediation.	2	Mediation.	2		
	Moderation.	2	Moderation.	2		
	Multigroup analysis. Higher order models.	2	Multigroup analysis. Higher order models.	2		
	Format of instruction	☒ <u>lectures</u> ☒ <u>seminars and workshops</u> ☒ <u>exercises</u> ☐ <i>on line</i> in entirety ☒ <u>partial e-learning</u> ☐ field work		☒ <u>independent assignments</u> ☐ multimedia ☐ laboratory ☒ <u>work with mentor</u> ☐ (other)		
Students are required to attend classes (lectures and exercises), with the attendance of minimum 70%. Additionally, students are required to actively participate in classes. Student activity will be monitored through self-evaluation quizzes that will be available on the course website within the Moodle platform. If a student takes less than two self-evaluation quizzes during the semester, the student will not be able to take the exam.						
Screening student work (<i>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</i>)	Class attendance	2 ECTS	Research		Practical training	
	Experimental work		Report		Individual assignments	2.5 ECTS
	Essay		Seminar essay		Test	
	Tests		Oral exam		Self-evaluation quizzes	0.5 ECTS
	Written exam	2.5 ECTS*	Project		(Other)	
Grading and evaluating student work in class and at the final exam	The exercises are performed on the computer using software packages SPSS, SmartPLS, Amos, Mplus.					
	Exam procedure: Two successfully completed individual assignments. For a final positive grade, both assignments must be graded positively. The final grade is calculated as the average of the grades achieved from the two individual assignments. Each assignment is graded with a grade from 1 to 5. Additional points can be earned based on student activity in class and exceptionally successful results on self-evaluation quizzes. These points are taken into account when grading the individual assignments.					
Alternatively, students can obtain a grade for the course through a written exam during the exam period. The exam includes practical tasks and theoretical						

	questions. Key points and appropriate grades for written exam: 0%-49% insufficient (1) 50%-62% sufficient (2) 63%-75% good (3) 76%-88% very good (4) 89%-100% excellent (5) *A student who achieves a positive grade on the individual assignments does not need to take the exam.		
Required literature (available in the library and via other media)	Title	Number of copies in the library	Availability via other media
	Vuković, M. (2022). Strukturalno modeliranje utjecaja bihevioralnih faktora na odlučivanje i performanse investitora na financijskom tržištu. Doctoral dissertation. Faculty of Economics, Business and Tourism, Split.		
	Hair, J. F., Black, W. C., Babin, B. J. & Anderson, R. E. (2019). Multivariate Data Analysis. 8th Ed. Andover: Cengage Learning.		
	Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M. (2017). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). 2nd Edition. Los Angeles: Sage Publications.		
	Kline, R. B. (2023). Principles and practice of structural equation modeling. 5th Edition. New York: The Guilford Press.		
	Teaching materials on Merlin course pages		Merlin
Optional literature (at the time of submission of study programme proposal)	Muthén, L.K. and Muthén, B.O. (1998-2015). Mplus User's Guide. Seventh Edition. Los Angeles, CA: Muthén & Muthén. Byrne, B.M. (2016). Structural Equation Modeling With AMOS: Basic Concepts, Applications, and Programming, Third Edition (3rd ed.). Routledge. Byrne, B. M. (2012). Structural equation modeling with Mplus: Basic concepts, applications, and programming. Routledge/Taylor & Francis Group. Hair, J. F., Sarstedt, M., Ringle, C. M. i Gudergan, S. P., 2017. Advanced Issues in Partial Least Squares Structural Equation Modeling. Los Angeles: Sage Publications. Gaskin, J. (2021), PLS, Gaskination's StatWiki. Articles: Vuković, M., Pivac, S., 2021. Does financial behavior mediate the relationship between self-control and financial security? Croatian Operational Research Review, Vol. 12 (1), pp. 27-36. Vuković, M., Pivac, S., 2021. The impact of business economics students' use of heuristics on their predispositions for long-term investment decisions. Proceedings of the 16th International Symposium on OPERATIONAL RESEARCH, Bled, Slovenia, 22-24 September, pp. 525-530. Mandić, A. i Vuković, M., 2022. Millennials attitudes, choices and behaviour - integrative analysis. Journal of Ecotourism, Vol. 21 (1), pp. 87-97. https://doi.org/10.1080/14724049.2021.1932925 Vuković, M., 2022. Personality as a predictor of students' heuristic and herding		

	biases in determining their predispositions for long-term investment decisions. Proceedings of the 77th International Scientific Conference on Economic and Social Development, online conference, 27 January, 2022, pp. 53-62. Vuković, M., 2023. The role of the financing source in the behavioral intention to buy real estate – Multigroup analysis. Proceedings of the 17th International Symposium on OPERATIONAL RESEARCH, Bled, Slovenia, 20-22 September, pp. 355-360. Vuković, M. & Pivac, S., 2024. The impact of behavioral factors on investment decisions and investment performance in Croatian stock market. Managerial Finance, Vol. 50 (2), pp. 349-366. https://doi.org/10.1108/MF-01-2023-0068 Vuković, M., 2024. Generational differences in behavioral factors affecting real estate purchase intention. Property Management. Vol. 42 (1), pp. 86-104. https://doi.org/10.1108/PM-11-2022-0088 Mandić, A., Knight, D. W., Vuković, M., & Thomsen, B. 2024. Place Attachment, Awareness of Environmental Responsibility and Pro-Environmental Behaviour of Visitors in Protected Natural Areas. Tourism Planning & Development, 1–26. https://doi.org/10.1080/21568316.2024.2353596 Kundid Novokmet, A. i Vuković, M, 2024. Financial Outcomes Of The Locus Of Control: Pls-Sem Evidence From Croatia. Studies in Business and Economics, 19(2), pp. 138-154. Vuković, M., 2024. CB-SEM vs PLS-SEM comparison in estimating the predictors of investment intention. Croatian Operational Research Review, Vol. 15 (2), pp. 131-144.
Quality assurance methods that ensure the acquisition of exit competences	• Monitoring obligations of students (teacher) • Control of Teaching (Vice-Dean) • Analysis of students' success in all subjects of study (Vice-Dean) • Student survey on the quality of teachers and teaching for each course of study (UNIST, Centre for Quality Improvement) • Exam administered by the subject teacher validates all the learning outcomes of the course. The contents of the exam are periodically reviewed. This revision is the basis for determining the adequacy of the ways of checking learning outcomes (Vice-Dean)
Other (as the proposer wishes to add)	