

DOCTORAL (PHD) STUDIES COURSE UNIT DESCRIPTION

Course unit title	Scientific areas	Faculty	Institute, department
Research Methods in Informatics and Informatics Engineering	Informatics engineering (T 007), Informatics (N 009)	Faculty of Mathematics and Informatics	Institute of Data Science and Digital Technologies
Study method	Number of credits	Study method	Number of credits
Lectures	1,5	Consultations	1
Individual works	3	Seminars	1,5 (spring)

Summary
The course provides a holistic view of research, taking into account the specifics of informatics and informatics engineering research. It systematically studies contemporary research principles, methods and techniques. Emphasis is placed on problems regarding conceptualization, modelling, the formulation and testing of hypotheses, computer experiment, and construction as a research method. Also discussed are issues regarding data collection, analysis, and evaluation methodologies, argumentation, research validity, ethics in research, the commercialization of science, and academic writing, with particular attention paid to the specifics of writing a dissertation. <i>Main topics:</i> • The concept of science and scientific research. • Information search. • Data gathering. • Analysis of phenomena in physical, social and virtual reality. • Theoretical research methods. • Experimental research. • Constructive research. • Statistical modelling. • Statistical hypothesis testing. • Comparative analysis. • Scientific theories and their development. • Scientific writing. • Literature review and literature survey. • Reasoning and scientific arguments. • Research projects and preparation of their proposals. • Commercialization of research results. • Ethics in research. • Parts of the dissertation and their writing. <i>Practical tasks:</i> the doctoral student must: 1. give presentations at the seminar, 2. write a research paper (an example), 3. write a research project proposal (an example), 4. write a review of a research paper.
Main bibliography
J. G. Brookshear, D. Brylow (2015) Computer Science: An Overview. 12th ed. Pearson
P. X.W. Zou, X. Xu (2023) Research Methodology and Strategy: Theory and Practice. Wiley-Blackwell
M. Q. Patton (2002). Qualitative Evaluation and Research Methods. 3rd ed. Newbury Park, CA: SAGE Publications

W. C. Booth, G. G. Colomb, J. M. Williams, J. Bizup, W. T. FitzGerald (2016). The Craft of Research, 4th ed., University of Chicago Press
K. Williamson, G. Johanson (eds.) (2017) Research Methods: Information, Systems, and Contexts. 2nd ed., Elsevier
B. C. Beins (2019) Research Methods. 4th ed., Cambridge University Press
A. F. Chalmers (2005). Kas yra mokslas? Apostrofa
J. Zobel (2004). Writing for Computer Science. 2nd ed., Springer
M. J. Katz (2009) From Research to Manuscript. A Guide to Scientific Writing. Springer
L. Rienecker, P. S. Jørgensen (2003). Kaip rašyti mokslinį darbą. Aidai
D. Gray (2009) Doing Research in the Real World. 2nd ed., SAGE Publications
J. W. Creswell (2014) Research Design: Qualitative, Quantitative and Mixed Methods Approaches. 4th ed., SAGE Publications
P. Cash, T. Stanković, M. Štorga (eds.) (2016) Experimental Design Research: Approaches, Perspectives, Applications. Springer
N. Walliman (2022) Research Methods: The Basics. 3rd ed., Routledge Taylor & Francis Group, London. https://doi.org/10.4324/9781003141693

Lecturer(s) (name, surname)	Science degree	Main publications
Audronė Lupeikienė	dr.	http://www.elaba.mb.vu.lt/dmsti/?aut=Audronė+Lupeikienė
Virginijus Marcinkevičius	dr.	http://www.elaba.mb.vu.lt/dmsti/?aut=Virginijus+Marcinkevičius
Igoris Belovas	dr.	http://www.elaba.mb.vu.lt/dmsti/?aut=Igoris+Belovas
Gintautas Dzemyda	habil. dr.	https://elaba.mb.vu.lt/dmsti/?aut=Gintautas+Dzemyda