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, emphasizing the specifics of informatics and informatics engineering research. It systematically studies contemporary research principles, methods and techniques. Issues of conceptualization, modelling, hypothesis formulation and verification, computer experiment, and design as a research method are emphasized. Issues of data collection, analysis and evaluation methodology, observation methodology, argumentation, scientific evidence, library research, comparative analysis, research ethics and scientific writing are discussed. The main directions of the philosophy of science are introduced.

Main topics:
1. Scientific research
2. Analysis of phenomena in physical, social and virtual reality
3. Theoretical research methods
4. Experimental research
5. Constructive research
6. Reasoning and scientific arguments
7. Problem solving methods
8. Information search
9. Data gathering and analysis
10. Research projects and their management
11. Scientific writing
12. Commercialisation of science.

Assessment:
1. presentations at the seminar,
2. one research paper,
3. one research paper review,
4. one project proposal.

Main bibliography

J. G. Brookshear (2012) Computer Science: An Overview. Addison-Wesley

M. Newhart, M. L. Patten (2023) Understanding Research Methods: An Overview of the Essentials. 11th ed. Routledge

N. K. Denzin, Y. S. Lincoln (Eds.) (1994). Handbook of Qualitative Research. Thousand Oaks, California, Sage Publications

M. Q. Patton (2002). Qualitative Evaluation and Research Methods. 3rd ed. Newbury Park, CA: SAGE Publications

C. G. Thomas (2021) Research Methodology and Scientific Writing. 2nd ed. Springer

W. C. Booth, G. G. Colomb, J. M. Williams, J. Bizup, W. T. FitzGerald (2016). The Craft of Research, 4th ed. The University of Chicago Press

K. Williamson, G. Johanson (Eds.) (2017) Research Methods: Information, Systems, and Contexts. 2nd ed. Elsevier

A. F. Chalmers (2005). Kas yra mokslas? Apostrofa (in Lithuanian)

A. Jasmontas (2003). Pažinimo filosofijos metmenys. Versus Aureus (in Lithuanian)

J. Zobel (2004). Writing for Computer Science. 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 (in Lithuanian)
P. Machamer, M. Silberstein (Eds.) (2002) The Blackwell Guide to the Philosophy of Science. Blackwell Publishers
J. W. Creswell (2013) Research Design: Qualitative, Quantitative and Mixed Methods Approaches. 2nd ed. SAGE Publishing
D. Gray (2009) Doing Research in the Real World. 4th edition. SAGE Publishing
P. Cash, T. Stanković, M. Štorga (Eds.) (2016) Experimental Design Research: Approaches, Perspectives, Applications. Springer
T. P. Ryan (2007) Modern Experimental Design. Wiley-Interscience

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.	http://www.elaba.mb.vu.lt/dmsti/?aut=Gintautas+Dzemyda