

Identification	Subject (code, title, credits)	ETR 645- Research methods-8 ECTS credits	
	Department	Physics and Electronics	
	Program (undergraduate, graduate)	master	
	Term	fall 2023	
	Instructor	Ahmad Asimov ph.D	
	E-mail:	fizikasimov@gmail.com	
	Phone:	+994124211093 (daxili255)	
	Classroom/hours	302 N Monday/Wednesday	
	Office hours	Tuesday: 15:00-16:00/ Thursday: 15:00-16:00	
Prerequisites			
Language	English		
Compulsory	Compulsory		
Required textbooks and course materials	Textbooks: 1. Research Methodology. Methods & Technique: Kothari. C.R. 2. Research Methodology, S.S Vinod Chandra, S Anand Hareendran, Pearson 3. Intellectual Property – Copyrights, Trademarks, and Patents by Richard Stim, Cengage Learning 4. Practical Research: planning and Design(8th Edition) – Paul D. Leedy and Jeanne E. Ormrod.		
Course description	Course Description: Course includes an overview of research method techniques, theoretical foundations of empirical research, principles of the scientific method, experimental designs, analyses of research designs, research protocol, and formation of research hypothesis. This course provides students with the body of theoretical knowledge and practical skills of scientific work		
Course objectives	The primary objective of this course is to develop student’s research orientation and to acquaint them with fundamentals of research methods. Specifically, the course aims at introducing them with the concepts and principles used in research and to business research methods and their approach. The objective of this course is to allow students learn and practice: <ul style="list-style-type: none"> • the process of thesis writing • how to plan a research project • the quantitative and qualitative research methods • Students will develop and demonstrate skills in using library sources; • Students will interpret, review, and critique research studies in the preparation of a brief literature review; 		
Learning outcomes	Upon completing this course, each student will be able to: <ul style="list-style-type: none"> • understand the purpose of research; • design and conduct research using a variety of methods; • identify and understand potential ethical problems during research process and ways • ability to distinguish research methods • bility to write and publish a technical research paper. 		
Teaching methods	Lecture		+
	Group discussion		+
	Quiz, Classroom Exams		+
Evaluation	Methods	Date/deadlines	Percentage (%)
	Midterm Exam		30
	Active participation		5
	Quizzes	4 quizzes during the semester	20
	Activity	During the semester	5
	Final Exam		40
	Total		100

Policy	<ul style="list-style-type: none"> ▪ Preparation for class The structure of this course makes your individual study and preparation outside the class extremely important. The lecture material will focus on the major points introduced in the text. Reading the assigned chapters and having some familiarity with them before class will greatly assist your understanding of the lecture. After the lecture, you should study your notes and work relevant problems and cases from the end of the chapter and sample exam questions. • Withdrawal (pass/fail) This course strictly follows grading policy of the School of Science and Engineering. Thus, a student is normally expected to achieve a mark of at least 60% to pass. In case of failure, he/she will be required to repeat the course the following term or year. ▪ Cheating/plagiarism Cheating or other plagiarism during the Quizzes, Mid-term and Final Examinations will lead to paper cancellation. In this case, the student will automatically get zero (0), without any considerations. ▪ Professional behavior guidelines The students shall behave in the way to create favorable academic and professional environment during the class hours. Unauthorized discussions and unethical behavior are strictly prohibited. ▪ Quizzes There will be a quiz examination per two weeks. The quizzes will be announced in the classroom two weeks before. Quiz is from homework problems. The homework problems will be selected from questions and problems in the end of each chapter. The No. of homework problems will be announced after finishing each chapter.
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Tentative Schedule

Week	Date/Day (tentative)	Topics	Textbook
1	19.09.23 26.09.23	Introduction-Objective of Research; Definition and Motivation; Types of Research; Research Approaches, Steps in Research Process; Criteria of Good Research; Ethics in Research. Research Formulation and Literature Review: Problem Definition and Formulation; Literature Review; Characteristics of Good Research Question; Literature Review Process.	Chapter 1
2	03.10.23 10.10.23	Primary & secondary data, Validity and Reliability of data collection procedures, data preparation, exploratory data analysis, parametric and nonparametric tests, correlation and regression analysis, Multivariate Techniques	Chapter 2
3	17.10.23 24.10.23	Research Design-Need for Research Design; Features of a Good Design; Types of Research Designs; Induction and Deduction. Hypothesis Formulation and Testing-Hypothesis; Important Terms; Types of Research Hypothesis; Hypothesis Testing; Z-Test; t-Test; f-Test; Making a Decision; Types of Errors; ROC Graphics	Chapter 3
4	31.10.23 07.11.23	Qualitative and Quantitative Research: Qualitative research – Quantitative research - Concept of measurement, causality, generalization, replication. Merging the two approaches.	Chapter 4
5	14.11.23	Midterm	
6	21.11.23	Measurement of Scaling Concepts: Scales of measurements, nominal, ordinal, interval and ratio scales, Errors in measurements. Validity and Reliability in measurement, Scale Construction Techniques	Chapter 5
7	28.11.23 05.12.23	Report Writing: Discussions, Conclusion, referencing and various formats for reference writing, bibliography, Thesis Writing, Thesis writing, Formats of publications in research journals including subject classification, Impact factor, Citation index.	Chapter 6
8	12.12.23	Test Procedures-Parametric and Non Parametric Tests;	

	19.12.23	ANOVA; Mann-Whitney Test; Kruskal-Wallis Test; Chi-Square Test; Multi-Variate Analysis.	Chapter 7
9	26.12.23	Presentation of the Research Work-Business Report; Technical Report; Research Report; General Tips for Writing Report; Presentation of Data; Oral Presentation; Bibliography and References; Intellectual Property Rights; Open-Access Initiatives; Plagiarism.	Chapter 8
		Final Exam	

