

Final Project

Course Syllabus

This course contributes to the requirements for the Degree of MSc in Computer Science

Title of the Academic Program	Master's Degree Programs in English “Digital intelligent control systems”
Type of the course	core /mandatory
Course period	Fourth semester: from October, the 1st to February, the 1st (18 weeks
Study credits	12 ECTS credits
Duration	432 hours
Language of instruction	English
Academic requirements	BSc degree in Computer Science or equivalent (transcript of records), good command of English (certificate or other official document)

Course Description

“Final project” is a core course.

Final project is a part of your training as a researcher in computer science and computer engineering. The project is the final part of the work on the dissertation and presents its practical part. During the implementation of the project, undergraduates work out in laboratory conditions the results of scientific research obtained at the previous stages of work on the dissertation. The project is carried out in specialized laboratories in scientific groups in the School of Space and Information Technologies or in other schools in Siberian Federal University (SFU).

Final project allows you to gain professional skills and experience in research activities. For successful development of Final project, the student must possess practical knowledge, skills, universal, professional and General professional competencies acquired as a result of mastering the previous blocks of the education program.

The aim of the “Final project” is to complete the final “practical” part of the thesis. At the same time, undergraduates must provide practical proof of the alleged scientific novelty of the research and the results of an analytical comparison of the results obtained in practice and the results obtained in preliminary calculations and modeling, as well as known solutions in the field of study.

Special Features of the Course

Master students will be offered Final project topics with assigned supervisors. However, students can also suggest their own topic, but a theme of a final project requires approval by the coordinator. Irrespective of the type of the project, you will always need a supervisor who is an SFU staff member (i.e. an assistant, associate, or full professor).

Work on the project involves the practical implementation of the necessary software and mathematical models, as well as hardware and software for the laboratory setup and / or laboratory demonstrator.

To work on the project, the magistrate is provided with specialized laboratory equipment and materials, including:

Laboratory of "Microprocessor systems"

Laboratory "Computer networks and telecommunications"

Laboratory “Software Development Technologies.

In each laboratory, a consultant engineer will be provided to support the work on the project.

Course Objectives

The objectives of the course are:

- ensuring the formation of professional research thinking of master students, forming a clear idea of the main professional tasks, ways to solve them;
- developing the ability to critically analyze and evaluate current scientific achievements, generate new ideas when solving research and practical problems;
- defining the area of scientific research and analyzing the state of the issue in the subject area under study; developing readiness and basic skills for self-formulation and solving problems that arise in the course of research activities and require in-depth professional knowledge;

– mastering modern methods of scientific research, development of experimental research methods;

- conducting experimental research, forming the ability to carry out complex research based on a holistic system of scientific worldview;

- processing and analysis of the results of theoretical and experimental research, the formation of skills to use modern technologies for collecting information, processing and interpreting the obtained empirical data.

Learning Outcomes of the Course

The main practical result of the course will be the received engineering solutions for the practical development of scientific assumptions, drawn up in the form of the final part of the thesis.

In addition, students publish a scientific article based on the results of practical implementation and prepare materials for patenting.

With the successful development of final project, the student must master practical knowledge, skills, and acquire the following competencies:

- knowledge of the methodology of theoretical and experimental research in the field of professional activity;

- the ability to independently carry out research activities in the field of computer science using modern research methods.

Course (module) Structure

Learning Activities	Hours
Self-study Assignments	432
Total study hours	432

Course Outline

Week	Assignments	Hours
1-3	Prepare to final project, familiarization with the goals, objectives and content, reports and deadlines for their submission, preparation of an time table and contents of project. Workplace safety briefing. Preparing the workplace of the engineer-researcher.	48

	Development of the first part of the report - the results of an in-depth analytical review on the research topic. Identification of the main technical characteristics and metrics for analytical comparison of known solutions and the expected results of the final project.	48
4-18	Development of requirements for the technical characteristics and composition of laboratory equipment for research. Assembling a laboratory demonstrator. Development of a methodology for conducting an experiment. Testing a laboratory setup. Preparation of a scientific article describing the laboratory facility.	96
	Experiments, accumulation and analysis of the results. Processing of the data obtained for the preparation of an analytical review. Development of the final chapter of the thesis. Preparation of the results of practical implementation for patenting. Registration of accompanying documents for transfer to the intellectual property agency.	180
	Processing and interpretation of research results. Presentation and publication of the results in the form of theses, articles, presentation at the theoretical seminar of the profile Department. Scientific interpretation of the data obtained, their generalization, analysis of the research work done, design of theoretical and empirical materials in the form of a report on final project.	60

Assessment

Preparation and execution of a report on the results of final project, the master student should issue a report that should reflect:

- the topic of the final project;
- the purpose of research work on the final project;
- the description of the studied metrics and technical characteristics;
- the description of the laboratory facility and / or workplace of the research engineer;
- the laboratory research methodology and the experiment;
- the results of a comparative analysis of the data obtained;

- conclusions based on the results of final project.

The report must be designed according to the General requirements and contain no more than 25 pages (font-14, spacing – 1.5).

Evaluation criteria: the grade "credited" is given to the student if the above points are correctly stated in the final project report; otherwise, the grade "not credited" is given.

Attendance Policy

Students are expected to work with their supervisor or lab assistant regularly. Meanwhile, excuses of various origin are permissible, in such case students take a consultation and do the necessary work at home (or at their own).

Web page of the course

Course materials and required reading materials are available on the webpage of the Externship <https://e.sfu-kras.ru/course/view.php?id=32915>, of the SibFU E-learning portal, www.e.sfu-kras.ru. You must be logged in to access this course:

Course Instructor(s) and Tutor(s), contact information



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Google Scholar page:

<https://scholar.google.ru/citations?user=JxdeoasAAAAJ&hl=ru>

Additional information is available at:

<https://structure.sfu-kras.ru/node/2153>

Core reading

1. Jan Recker. Scientific Research in Information Systems. A Beginner's Guide. Springer International Publishing. 2013., p.164. ISBN 978-3-642-30048-6.
2. Yvonne N. Bui. How to Write a Master's Thesis. Third Edition. SAGE publications, Inc. 2020. p.298. ISBN-13: 978-1506336091, ISBN-10: 1506336094.

3. Andersen, J., Toom, K., Poli, S., & Miller, P. F. (2017). Research Management: Europe and Beyond. Academic Press.
4. Wingate, L. M. (2014). Project management for research and development: guiding innovation for positive R&D outcomes. CRC press.

Facilities, Equipment and Software

Laboratory of "Microprocessor systems", Laboratory "Computer networks and telecommunications", Laboratory "Software Development Technologies. Including: Testing equipment, laboratory benches, consumables, electronic assemblies and components, development boards, sensors, executive automation systems, integrated development environments, as well as Internet access, Microsoft Office®.