# Research Seminar
# Course Syllabus

**This course contributes to the Degree of MSc in Computer Science**

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|---|---|
| **Title of the Academic Program** | Master's Degree Program "Digital intelligent control systems" (delivered in English) |
| **Type of the course** | core /mandatory |
| **Course period** | 2 semesters<br>First semester: from February, the 1st to June, the 1st (18 weeks)<br>Second semester: from October, the 1st to February, the 1st (18 weeks) |
| **Study credits** | 8 ECTS credits |
| **Duration** | 288 hours |
| **Language of instruction** | English |
| **Academic requirements** | • BSc degree in Computer Science or equivalent (transcript of records),<br>• good command of English (certificate or other official document). |

## Course Overview

## Description

"Research Seminar" is a core course.

The aim of this course is twofold: one, to allow you to make progress on your research in a structured way and to help fulfill program requirements, and two, to present professionalization information crucial to success in the field. At first, students have a discussion and make the presentation of a draft of a research paper. The course is organized largely around working on the research paper, with the goal of making it a conference-presentable and journal-publishable work. Topics covered include abstracts, publishing, handouts, presentation skills, course design, creating and maintaining a cv, cover letters, webpages, and in general everything that is required for you to successfully compete for jobs in intelligent computer system.

**The aim** of the course is to guide students through the process of writing a master thesis. This demands ability to link research question, research strategy, theory and methodology of experiment. The seminars in this course will help the students make a research and write a master thesis. Students will use the knowledge gained from course.

## Course Objectives

- to teach students to identify a research problem or research question;
- to familiarize students with the methodology of working with primary sources and performing patent searches;
- to familiarize students with the main body of the master's work;
- to teach students to present and discuss their own work;
- to teach students to read and comment on the work of other students;

- to familiarize students with the basic principles and requirements for submitting a dissertation for defense.

## Learning Outcomes of the Course

By the end of the course, students will know:

- writing a thesis and an article outline;
- references and research ethics;
- prepare a presentation of science project.

By the end of the course, students will be able to:

- define a research problem or research question;
- build a scientific argument;
- present and discuss own work;
- read and comment upon another students' work.

By the end of the course, students will possess:

- independent work, critical/analytical thinking;
- use scientific methods to analyze technical dimensions of knowledge and technology.

## Course Structure

| Learning Activities | Hours |
|---|---|
| Lectures | - |
| Seminars | 36 |
| Assignments | 216 |
| Final Exam (including preparation) | 36 |
| **Total study hours** | **288** |

## Detailed Schedule

| Week | Seminars/ Assignments | Hours Sem/HA |
|---|---|---|
| Semester 1 | | |
| 1-2 | Survey of the subject area of research. Search and selection of a personal area of interest. Review of sources in the subject area of research. | 2/8 |
| 3-4 | Presentation of the results of the analytical review in the selected area of interest. Collective discussion of the research topic. | 2/8 |
| 5-6 | Development of a research plan. Discussion of the main idea for the practical implementation of the research results. Collective brainstorming to shape the proposed scientific novelty of the research. | 2/8 |
| 7-8 | Review of patents and presentation of the results of the patent search. | 2/8 |
| 9-10 | Preparation of the theses of the report and overview presentation of the project. | 2/16 |
| 11-13 | Development and filling of the project's WEB-site. | 2/16 |
| 14-16 | Development of a dissertation plan, formation of a list of the main sources used and design of the first section of the dissertation. | 4/18 |
| 17-18 | Preparation of an article based on the results of the work. Project presentation for collective discussion. | 2/8 |
| Semester 2 | | |
| 1-2 | Development of the required models and the formation of a list of basic metrics for modeling technical solutions on the research topic. | 2/8 |
| 3-4 | Presentation of the second section of the dissertation. Preparation of an article based on the results of model development. Preparation of an application for an intellectual property object. | 2/8 |
| 5-6 | Development of a plan for experimental testing of the solutions obtained. Creation of a research engineer's workplace in laboratory conditions. Presentation of the laboratory test bench. | 2/8 |
| 7-8 | Development of report abstracts on the practical implementation of elements, assemblies and embedded software in laboratory conditions. Experimental development of the obtained technical solutions. | 2/8 |
| 9-10 | Preparation of an article based on the results of practical development of the obtained technical solutions. | 2/16 |
| 11-13 | Development and presentation of the third section of the dissertation based on the results of experimental testing. | 2/16 |
| 14-16 | Comparative analysis of the expected and obtained results of the dissertation work. Proof of the alleged scientific novelty of the research. Presentation of the fourth section of the dissertation. | 4/16 |
| 17-18 | Complex presentation of dissertation work. | 2/16 |
| | **36** | **288** |
| **36** | **Final Exam** | **36** |

## Course Instructor and Tutor, contact information

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Google https://scholar.google.ru/scholar?hl=ru&as_sdt=0%2C5&q=непомнящий+олег+владимирович&btnG=
Additional information is available at:
https://structure.sfu-kras.ru/node/2153

## Assessment

| Assessment strategy | Points, max | Evaluation criteria |
|---|---|---|
| Personal project | 60 | Presentations, thesis, articles, the dissertation. |
| Final exam | 40 | Complex presentation of the project. |

Grading policy for final assessment is:

- A (excellent work) 91–100 points
- B (above average) 81–90 points
- C (average) 71–80 points
- D (below average) 50–70 points
- F (failed) < 50 points

## Attendance Policy

Students are expected to attend classes regularly.

Every topic involves an assignment. A written report on the assignment should be submitted within two weeks from the moment students received a list of problems. The final mark will rely on the same grading policy as for the final exam.

## Web page of the course

Course materials and required reading materials are available on the webpage of the course **Research Seminar**, SibFU E-learning portal, www.e.sfu-kras.ru . You must be logged in to access this course. https://e.sfu-kras.ru/course/view.php?id=31564

## 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. David Hitchcock. Patent searching made easy: how to do patent searches on the internet & in the library. Sixth edition. Berkeley, CA: Nolo, April 2013 p.257. ISBNs: 9781413318722, 141331872X, 9781413318739.
3. 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.

## Facilities, Equipment and Software

Internet access;
Microsoft Office®.