

## Methodology of research and presentation of Research

### Results for postgraduate students

#### Course Syllabus

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

|                                      |   |
|--------------------------------------|---|
| <b>Title of the Academic Program</b> | Programs in English "Computer Science"  |
| <b>Type of the course</b>            | core /mandatory   |
| <b>Course period</b>                 | 1 semesters<br>First semester: from October, the 1st to February, the 1st (18 weeks)  |
| <b>Study credits</b>                 | 3 ECTS credits  |
| <b>Duration</b>                      | 108 hours   |
| <b>Language of instruction</b>       | English   |
| <b>Academic requirements</b>         | <ul style="list-style-type: none"><li>– Master's Degree in Computer Science or equivalent (transcript of records),</li><li>– good command of English (certificate or other official document)</li></ul> |

## **Course Description**

The course aim is to provide knowledge and practical skills for effective reading, analysing, critiquing scientific articles in primary journals, writing up a draft manuscript of such an article, and publish it in the primary scientific journal. The course includes four segments. In segment 1 you will get familiar with the genres of professional scientific literature, system of professional scientific publications, and scientometric indicators. In segment 2 you will learn how to search and find publications related to your master research project, read and analyse them. In segment 3 you will learn how to structure, write up the text of the original article, and how to choose the proper journal to publish your manuscript. Segment 4 is devoted to the principles of scientific research ethics, authorship and publishing.

Students will be asked to attend a weekly class and to complete some reading, analyzing, writing, editing, and peer-reviewing exercises, including writing and reviewing an original paper (10000 characters). As the final assessment the students are to submit the committee the manuscript of original articles and present the research results in the form of oral presentation in the professional scientific conferences.

## **Special Features of the Course**

The course is intended for those students who are planning to become professional researchers in STEM fields. But writing is thinking and writing exercises themselves enhance thinking. So, the main virtual outcome of the course is the enhancement of your thinking capability. The course slogan is “Good writing is based on good reading”.

I am sure that you soon realize that scientific writing is the natural part of the research process and this part is as important as the research

procedures. The course will develop your ability to contribute to the production of the novel research results in the written published text for the professional audience and contribute to scientific knowledge. And even if you are not going to be a scientist, good writing skills would be extremely helpful in any career.

### **Course Aim**

To provide students from an intermediate to advanced level of knowledge and practical skills in reading, analyzing, writing up, publishing original articles, and presenting the research results in professional scientific conferences

### **Learning Outcomes of the Course**

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

- search and find primary scientific publications related to your research interests
- read rhetorically, analyse, and critique primary scientific publications related to your research interests
- write up the draft manuscript of your article in the format of peer-reviewed journals
- choose the journals for publishing your manuscripts
- submit the manuscript to the journal and answer the reviewers' remarks
- follow the ethical principles in conducting, writing and publishing articles in the professional scientific journals
- present your research results in the professional scientific conferences

## Course Structure

| Learning Activities          | Hours      |
|------------------------------|------------|
| Lectures                     | 18         |
| Practice sessions / Seminars | 18         |
| Self-study Assignments       | 72         |
| <b>Total study hours</b>     | <b>108</b> |

## Course Outline

| Week | Lectures  | Practice sessions / Seminars/Labs | Self-Study Assignments  | Hours <sup>1</sup> |
|------|---|-----------------------------------|---|--------------------|
| 1    | Introduction to the course. The publication as the main outcome of the professional researcher. How the science works: from the idea to publication. Significance of written communication in the scientific community. | No                                | Home assignment: preparing the oral presentation about your Ph.D. projects. | 2/0/4              |

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1 Hours designed for lectures/practice sessions .../self-study assignments.

|     |   |   |  |            |
|-----|---|---|--|------------|
| 2   | Genres in the scientific literature and the international system of scientific publications. Primary peer-reviewed journals and predatory journals. Introduction to science metrics. How to search and find primary scientific articles. A brief overview of the publication procedure. | Practice sessions: (1) self-presentation at the seminar; (2) searching for articles related to your Ph.D. research topic. | Home assignments: (1) searching for articles related to your research topic; (2) preparing the list of journals publishing these articles; the preparation of the articles' list related to your Ph.D. research project. | 2/2/8      |
| 3   | The structure of a typical original article.  | Seminar: presentation of the articles' and the journals' lists.   | Home assignment: analyzing the structure of three original articles (written).   | 2/2/8      |
| 4-5 | The introduction section in the original article: rhetoric structure, how to read and interpret.  | Practice session: framing the specific problem of your research.  | Home assignment: rhetoric analysis of the introduction section in the published article (written).   | 2/2/1<br>2 |
| 6-7 | How to write up the materials and methods section.  | Seminar: presentation of the rhetorical analysis of the introduction section.   | Home assignment: writing up the text describing the methods applied in your research.  | 2/2/8      |
| 8-7 | Structure of the results section in the article. The coherence of data and their descriptions; reliability and validity of the results; the approach applied in the research. The layout of data and results representation. Tables and diagrams.                                       | Writing lab: consulting and mutual reviewing of the method section in your manuscript                                     | Home assignments: (1) reading and rhetorical analysis of the Results section in the article; (2) writing up the results section of your short paper manuscript.  | 2/2/8      |

|       |   |  |  |       |
|-------|---|--|--|-------|
| 9-10  | The Discussion section: relevance, structure, arguments                 | Writing lab: consulting and mutual reviewing the texts of the Results section  | Home assignments: reading and rhetorical analysis of the Discussion section in the article; (2) writing up the discussion section of your manuscript.    | 2/2/8 |
| 11-12 | The models of title, byline, abstract, and the keywords of the article. | Writing lab: consulting and mutual reviewing the texts for the introduction section/   | Assignments: (1) analyzing the title, byline, and abstract of the articles from the article list; writing up the title and abstract for your manuscript. | 4/2/8 |
| 13-15 | No  | Writing lab: consulting and mutual reviewing the discussion sections in your manuscripts   | Preparation of the draft manuscript of the short article on the results of your MS research project for final assessment, mutual reviewing.              | 0/2/8 |
| 16    | No  | Final assessment seminar: presentation of the draft manuscript of extended thesis on your MS research project, mutual reviewing. |  | 0/2/0 |

### Assessment

There are two final assessment tasks: (1) the manuscript presenting the results of your Ph.D. research project, written up in the format of the original paper for the primary scientific journal; (2) the oral presentation of your research results in the format of professional scientific conferences.

## **Attendance Policy**

Students are expected to attend classes regularly. In case of missing the in-class activity, a student should perform an additional exercise (will be given by the instructor) within one week.

Every topic has a home assignment work that should be done in written form (except several questions in the first assignment). The report on the assignment should be submitted before the lecture within 5 days from the moment students received a list of problems. The final mark will be made by the same grade policy as for a final exam.

## **The Web page of the course**

The webpage of the course “Writing and Presenting Science for Ph.D students” is available through the E-learning SibFU web site: [www.e.sfu-kras.ru](http://www.e.sfu-kras.ru). You must be logged in to access this course. The Course Guide and all accompanying materials are also available on the course web-page.

## **Core reading**

1. Powell M. Reading Rhetorically. Handouts materials. Available on the course web-page.
2. How to Write a Paper in Scientific Journal. Style and Format.
3. Available at <https://www.bates.edu/biology/files/2010/06/How-to-Write-Guide-v10-2014.pdf>

## **Supplementary reading**

4. Yeong Foong May. How to read and critique a scientific research article. Notes to guide students reading primary literature (with teaching tips for faculty members). World Scientific Publishing, 2014. 102 P. ISBN-13;978-9814579162.

5. Cargil M. O`Connor P. Writing scientific research articles. Strategy and Steps. Wiley-Blackwell, 2013. Second Edition. ISBN 978-1-118-57069-2 (paper), 978-1-11857070-8 (eBook).

6. Gastel B., Day R.A. How to write and publish a scientific paper. Eighth Edition. Greenwood, 2016. EISBN: 978-1-4408-4263-4.

7. Wilke C.O. Fundamentals of data visualization. A primer on making informative and compelling figures. O`Reilly, 2019. ISBN: 978-1492-03108-6.

8. Alley M. The craft of scientific presentations. Critical steps to succeed and critical errors to avoid. Second Edition. Springer, 2013. ISBN: 978-1-4419-8278-0 (paper), 978-1-4419—8279-7 (eBook).

9. Alley M. The craft of scientific writing. Fourth Edition. Springer, 2018. ISBN: 978-1-4419-8278-2 (paper), 978-1-4419—8288-9 (eBook).

10. Schimel J. Writing science. How to write papers that get cited and the proposlas that get funded. Oxford University Press, 2012. ISBN: 978-0-19-976023-7 (paper).

### **Facilities, Equipment, and Software**

Personal portable computer with Internet access for classes

Microsoft Office or any other software for text writing and editing, diagram drawing, and preparing oral presentations.