

Computers in biology

Course abstract

The aim of the course is to provide students with the basic knowledge on effective use computer programs in biological studies and research. Practical assignments with text editors, Internet browsers, spreadsheets, graphics editors must be done. Specific software such as image analysis programs and Geographical Information Systems are used too. Methods of search and reorganization of scientific information are used.

Course plan

Lesson 1

Text editors. Text document formats. *Microsoft Word*. Options window (File – Options). Showing of all formatting marks. Formatting marks – paragraph mark, space, tab character.

Formatting of the page (Layout – Page Setup). Page format (A4, Letter etc.). Margins. Header and footer. Different first page for header and footer.

Breaks (Layout – Breaks). Page break, column break, Section breaks. Different page formatting for sections.

Formatting of characters (Home – Font). Font, font size, font style etc. Expanded spacing.

Formatting of paragraphs. Ruler (View – Ruler). First line indent, hanging indent.

Paragraph window (Home – Paragraph). Outline level (Level 1, Level 2 etc.). Spacing before and after paragraph.

Regulation of Page breaks (Home – Paragraph – Line and Page Breaks). Widow/ orphan control, Keep with next, Keep lines together, Page break before.

Lesson 2

Search of scientific information.

Library of the University of Latvia (<https://www.biblioteka.lu.lv/eng/>). Electronic resources (Resources – Electronic Resources A – Z – UL Subscribed Databases).

Full text databases. Scientific journals. Springer Link, Science Direct, Cambridge Journals Online, Oxford Journals, JSTOR.

Search of scientific papers (<https://scholar.google.com/>). Search using scientific terms.

Advanced search. Search by authors, years, journals.

References. Reference list at the end of scientific paper. Reference list standards.

Assignment 1.

Study course title Computers in biology
Study course code Biol1063
Credits 2
European Credit Transfer and Accumulation System Credits 3
Total Number of Contact Hours 32
Number of Lecture Hours 5
Number of Seminar and Practical Assignment Hours 27
Independent study hours 48
Course approval Date 20.10.2014
Responsible Unit Faculty of Biology
Academic Staff Responsible for Branch of Science Uldis Kondratovičs

Course developer
Didzis Tjarve

Replaced course
DatZ1078 [2DAT1078] Computing

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Learning outcomes

After successful studies students will be able

- To prepare correctly formatted scientific document;
- To prepare raster and vector graphics for scientific purposes;
- Automatically reorganise scientific data;
- To find scientific literature by using Internet; ·To create cartographic material by including orthophoto and vector maps as well as user prepared information.

Requirements for awarding credits

Student's assessment includes:

- 13 practical assignments (50%),
- Practical exam (50%), In the case of absence students have to study independently and consult with their teachers during their office hours.

Compulsory Reading List

Paenson D., Hons B.A., 2014. Apache OpenOffice Writer for students. <http://openoffice-uni.org/openoffice-uni-en.pdf>

OpenOffice.org, 2011. OpenOffice.org 3.3 Calc guide. <https://wiki.openoffice.org/w/images/3/32/0100GS33-GettingStartedOOo33.pdf>

Fereira T., Rasband W., 2012. ImageJ User Guide. <http://imagej.nih.gov/ij/docs/guide/user-guide.pdf>

Bah T., 2011. Inkscape Guide to a Vector Drawing Program. Fourth Edition.
<http://www.inkscape.org/en/learn/books/> QGIS Project, 2014. QGIS User Guide. Release 2.2.
<http://www.qgis.org/en/docs/index.html>

Further Reading List

Dažādi nodarbībās izmantotās programmatūras apraksti.

Periodicals and Other Sources

<http://priede.bf.lu.lv/scripts/atteli/albums.cgi?s=uzskatei>

Course plan Type Hours

- | | | |
|--|---|---|
| 1. Software used for in biological studies. | L | 2 |
| 2. Processing and analysis of raster images. | L | 1 |
| 2. Processing and analysis of raster images. | P | 3 |
| 3. Creation of schematic images by using vector graphics. | P | 6 |
| 4. Use of Geographical information systems in biological investigations. | L | 1 |
| 4. Use of Geographical information systems in biological investigations. | P | 5 |
| 5. Search of scientific information. | L | 1 |
| 5. Search of scientific information. | P | 2 |
| 6. Preparation of scientific document. | P | 6 |
| 7. Preparation, reorganization and summarizing of scientific data. | P | 6 |