**CELL BIOLOGY BBI1205**

**TOPICS and REQUIREMENTS**

***Lectures***

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| **Week** | **Topic** | **Remarks** |
| **1** | Organization of the prokaryotic and eukaryotic cells. Origin of the eukaryotic cell |  |
| **2** | The structure and function of plasma membrane. Membrane transport |  |
| **3** | Electrical properties of membranes. Glycocalyx. Cell surface antigens, receptors. Cell adhesion |  |
| **4** | The cytosol and the cytoskeleton |  |
| **5** | Cellular motility |  |
| **6** | Types and functions of the endoplasmic reticulum |  |
| **7** | The Golgi apparatus. The endosomal-lysosomal compartment |  |
| **8** | Endocytosis, exocytosis, secretion |  |
| **9** | The structure and function of peroxisomes, mitochondria, and chloroplasts |  |
| **10** | Nuclear structure and function |  |
| **11** | Chromatin and chromosomes |  |
| **12** | The cell cycle. Mitosis |  |
| **13** | Meiosis |  |
| **14** | The differentiation, ageing and death of cells |  |

***Practical course***

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| **Week** | **Topic** | **Remarks** |
| **1-2** | General laboratory, occupational safety and fire regulations. Laboratory schedule. Operation of the light microscope. |  |
| **3-4** | The organization of fungal cells. Observation of yeast model organisms in light microscope |  |
| **5-6** | The organization of plant and animal cells. Staining of plant cells for light microscopic observation. Examination of human blood in light microscope |  |
| **7-8** | The types of cell division. Examination of chromosomes in plant cells |  |
| **9-10** | The structure of electron microscopes. Methods for preparation of EM specimens. Recognition and characterization of organelles in EM images. Basics of fluorescence microscopy. Luminescent labeling of cellular structures |  |
| **11-12** | Cell culture basics. Visit in the Agricultural and Molecular Research Institute (fluorescence microscope, cell culture laboratory) |  |
| **13-14** | Closing exercise. Evaluation of the semester's work. |  |

**Requirements:**

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| Participation in classes: | Attending the lectures is recommended.  Participation in the practical course is mandatory. |
| Inspections during the semester: | Regular mid-term tests in practical course |
| Credit assigned to the subject: | 4 |
| Method of determining the grade: | Accomplishment of the practical course is a precondition to taking an oral exam.  Evaluation of the performance:  0-49 %: fail  50-59 %: pass  60-79 % satisfactory  80-89 %: good  90-100 %: excellent |
| Recommended readings: | Students receive the ppt presentations of the lectures (in pdf format) at the beginning of the course.  Alberts, Hopkin, Johnson et.al.,: Essential cell biology. 5th edition. W.W. Norton & Company, 2019. ISBN-13 978-0393680379 |
| Recommended homepages: |  |