



## *Module syllabus: Introduction to the structure of eukaryotic organisms*

### 1. Overall information

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| Module coordinator                               | Professor Robert Hasterok                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Contact                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| ECTS                                             | 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Method for the verification of learning outcomes | <p>The final grade for the module is weighted on the average of the following grades:</p> <ul style="list-style-type: none"><li>- laboratory grade (0.5)</li><li>- final written exam (0.5)</li></ul> <p>To be awarded a final grade, the student must pass each activity within the module.</p> <p>The laboratory grade is weighted on the average of the following student activities:</p> <ul style="list-style-type: none"><li>- practical skills evaluation (0.2)</li><li>- mean written test results (0.8)</li></ul> |

### 2. Description of student activity and work

| Lecture/discussion sessions              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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| Responsible instructors                  | Professor Robert Hasterok; Dr Weronika Rupik                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Content                                  | <p><b>The module provides</b> basic knowledge about the structure and function of the basic cell substructures and organelles. The module presents the relationships between the structure and function of tissues and organs. It also instructs students about basic microscopic techniques and microscopic observations. Students learn how to use a light microscope, acquire and develop their ability to conduct simple microscopic observations and to document them.</p> <p><b>Lectures sessions</b> comprise the basics of the structure and function of the cell substructures and organelles and define tissue and the classification system, origin, framework and distribution of plant and animal tissues.</p> <p><b>Lecture session content:</b><br/>Eukaryotic cell structure; comparison of prokaryotic and eukaryotic cells; organelle structure and function in plant and animal cells;<br/>Growth and development of plants; plant cell differentiation; plant tissue definition and classification.<br/>Animal tissue definition and classification; Characterisation of animal tissues: epithelial tissue; connective tissues; cartilage and bone tissue; ossification; blood; muscle tissue; nervous tissue and glia.</p> |
| Number of didactic hours (contact hours) | <b>20</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Literature                               | William C. Dickison "Integrative Plant Anatomy" Harcourt Academic Press, 2000.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |





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|  | <p>Ray F. Evert "Esau's Plant Anatomy: meristems, cells, and tissues of the plant body: their structure, function and development" A John Willey &amp; Sons Inc. Publication, 2006.</p> <p>Gartner L.P. Textbook of Histology, 4<sup>th</sup> Edition, Elsevier 2016-2017.</p> <p>Sorenson R.L. Atlas of Human Histology. A guide to microscopic structure of cells, tissues and organs. 2008.</p> |
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| Laboratory                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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| Responsible instructors                  | Staff of the Department of Plant Anatomy and Cytology and the Department of Animal Histology and Embryology                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Laboratory                               | <ol style="list-style-type: none"><li>1. Light microscopy, tissue preparation, observations and biological documentation.</li><li>2. Plant cell structure.</li><li>3. Classification and characterisation of plant tissues: meristems, dermal tissues, parenchyma, collenchyma, sclerenchyma, xylem, phloem.</li><li>4. Structure and function of vegetative plant organs: stem, root, leaf and their modifications.</li><li>5. Plant generative organs.</li><li>6. Epithelial tissue: simple epithelium, stratified epithelium, glandular epithelium.</li><li>7. Connective tissue proper and regular.</li><li>8. Cartilage tissue and bone tissue.</li><li>9. Blood.</li><li>10. Muscular tissue: smooth muscle tissue, skeletal muscle tissue and cardiac muscle tissue.</li><li>11. Nervous tissue.</li></ol> |
| Methodology of laboratory classes        | Work under the supervision of an instructor – microscopic observation of biological preparations, discussing and documenting the results of the observations (notes, drawings, diagrams). Laboratory work using a light microscope                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Number of didactic hours (contact hours) | 70                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Literature                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

### 3. Forms of verification

| Practical skills evaluation |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| Grades                      | <p>Practical skills are examined during each practical. The assessment comprises an evaluation of the student's efficiency in operating a microscope and laboratory work, evaluation of the quality of biological preparations, evaluation of the student's ability to identify and describe the structures observed.</p> <p>Grades are awarded on a scale of A-F, where A is excellent and F is a fail.</p> <p><u>Excellent performance (A)</u> – the student actively participates in the laboratory work, demonstrates an excellent understanding of the experimental procedures and is engaged in solving current problems. The experiment documentation is complete, of a high quality and is correctly described.</p> |





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|  | <p><u>Good performance (C)</u> – the student demonstrates good judgment and knowledge, correctly conducts experiments, correctly exhibits a sense of the experimental procedure. The experiment documentation is complete, of good quality and is generally correctly described.</p> <p><u>Satisfactory performance (E)</u> – the student demonstrates satisfactory judgment and knowledge, is moderately engaged and needs additional assistance to finish the experiment and prepare the final assessment of the experimental results correctly. The experiment documentation is only partial, of a low quality with a partially correct description.</p> <p><u>Insufficient performance (F)</u> the student is not engaged in the experiments, does not exhibit a sense of the experimental procedures, poorly interprets and presents the experimental results. The experiment documentation is incomplete, of a very low quality and is incorrectly described.</p> |
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### Written test

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| Evaluation | There will be a written test to evaluate the knowledge and skills acquired during practicals.<br>Grades for the reports are awarded on a scale: A-F, where A is excellent and F is a fail. |
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### Final written exam

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| Grades | <p>A positive evaluation of laboratory activity is required to be admitted to the final written exam. The exam comprises the topics presented during both the lectures and laboratories.</p> <p>Grades are awarded on a scale of A-F, where A is excellent and F is a fail.</p> <p>Excellent (A) <math>\geq 85\%</math> – the student presents fluent knowledge of the structure and function of the basic cell substructures and organelles, plant and animal tissues and plant organs.</p> <p>Very good (B) 76-85% – the student presents a very good knowledge of the structure and function of the basic cell substructures and organelles, plant and animal tissues and plant organs, makes very rare and minor errors.</p> <p>Good (C) 66-75% – the student presents a good knowledge of the structure and function of the basic cell substructures and organelles, plant and animal tissues and plant organs, makes rare but minor errors.</p> <p>Satisfactory (E) 52-60% – the student exhibits a satisfactory knowledge of the structure and function of the basic cell substructures and organelles, plant and animal tissues and plant organs and makes moderate errors.</p> <p>Fail (F) below 51% – the student does not present a satisfactory knowledge of the structure and function of basic cell substructures and organelles, plant and animal tissues and plant organs and makes many major errors.</p> |
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