

<b>Subject name</b>	<b>Diversity of Plant Anatomy as Habitat Adaptation</b>	
<b>Subject code</b>	<b>E.1z.DPH.SC.ECTIE.O</b>	
<b>Department</b>	<b>Unit of Botany and Plant Physiology, Institute of Plant Biology and Biotechnology</b>	
<b>Faculty</b>	<b>Faculty of Biotechnology and Horticulture</b>	
<b>Subject supervisor/Lecturer</b>	<b>Barbara Nowak Ph.D., Ewa Sitek Ph.D., Piotr Stolarczyk Ph.D., Gajewski Zbigniew Ph.D.</b>	
<b>General information</b>	<b>Teaching period</b>	<b>winter</b>
	<b>ECTS credits</b>	<b>6</b>
	<b>Lectures total</b>	<b>10</b>
	<b>Lab classes</b>	<b>20</b>
<b>Objective and general description</b>	Modifications of the plants structure as adaptation to different habitat conditions, with particular emphasis on changes in anatomy. Based on fresh and permanent histological specimens performed by students.	
<b>Lectures</b> <b>5 × 1 hour</b>	<ol style="list-style-type: none"> <li>1. Aquatic and wetland plants (hygrophytes, hydrophytes) and their adaptations.</li> <li>2. The quality of light. Plants of moist shady habitats (sciophytes) against heliophytes. Epiphytes and vines.</li> <li>3. Plant of low- nutrient conditions: mycorrhizal associations, nitrogen-fixing symbionts, parasitic plants, carnivorous plants.</li> <li>4. Plants of cold and hot arid habitats.</li> <li>5. Halophytes and salt exclusion mechanisms. Salt marshes and mudflats.</li> </ol>	
<b>Laboratories</b> <b>25 hours</b>	<ol style="list-style-type: none"> <li>1. Basic methods of preparing specimens: fresh versus permanent. Trichomes as different adaptations - observation on fresh preparations. (1 h) Methods of fixing plant material for permanent preparation. Making own paraffin section of example object - fixing in Carnoy's solution. (2 h)</li> <li>2. Aquatic and wetland plants: fresh preparations of aerenchyme, epidermis with trichomes and stomata. (1 h) Making own paraffin section of example object - internal embedding in paraffin after chloroform treatment. (3 h)</li> <li>3. Plants of moist shady habitats, heliophytes and epiphytes. Comparison of mesophyll, epidermis, cuticle. Fresh preparation of cross section of epiphyte air root. (2 h)</li> <li>4. Plants of arid habitats - xerophytes. Structure preventing water loss and to store available water. Comparison of xeromorphic features in <i>Nerium oleander</i> (fresh preparation), <i>Pinus silvestris</i> and <i>Secale cereale</i> leaves. (2 h)</li> <li>5. Making own paraffin section of example object - external</li> </ol>	

	<p>embedding in block of paraffin. (1 h)</p> <p>6. Making own paraffin section of example object - sectioning on a microtome and mounting on slides. (2 h)</p> <p>7. Making own paraffin section of example object - staining of prepared cross sections in water dissolved dyes: alcian blue and hematoxyline to reveal nuclei. (5 h)</p> <p>8. Making own paraffin section of example object - double staining of prepared cross sections in ethanol dissolved dyes: fast green and saphranine to reveal woody cell walls. (5h)</p> <p>9. Observation, interpretation and comparison of prepared cross-sections. (1 h)</p>
<b>References</b>	<p>Peterson R.L., Peterson C.A., Melville L.H., 2008. Teaching Plant Anatomy. NRC Press.</p> <p>Ingrouille M.J., Eddie B., Plants. Diversity and Evolution. Cambridge (chosen chapters).</p>