

<b>Subject name</b>	<b>Molecular Background of Crop Production</b>	
<b>Subject code</b>	<b>E.1.MBCP.SC.ECTIE.R</b>	
<b>Department</b>	<b>Plant Physiology</b>	
<b>Faculty</b>	<b>Agriculture and Economics</b>	
<b>Subject supervisor/Lecturer</b>	<b>Professor Marcin Rapacz</b>	
<b>General information</b>	<b>semester</b>	<b>winter</b>
	<b>ECTS credits</b>	<b>7</b>
	<b>Lectures total</b>	<b>24 hrs</b>
	<b>Laboratories</b>	<b>15 hrs</b>
<b>Objective and general description</b>	<p>Molecular regulations of plant response to environmental factors are crucial for plant yielding, bot under favourable and stress conditions. During the course basic molecular regulations in plants will be presented with the special focus on crop yielding and main abiotic stress response. The possibility f genetic transformations which may help to maintain high yielding under unfavourable environmental conditions will be discussed.</p> <p>Lectures</p> <ol style="list-style-type: none"> <li>1.Introduction: interactions between plant genome and environment in plant growth, development and evolution;</li> <li>2. Basic mechanisms of gene expression regulation in plant;</li> <li>3.Basic signal transduction pathways in plants</li> <li>4.Perception of the environmental signals in plant cells.</li> <li>5. Photosynthetic redox signaling in plants and its role in a stress response.</li> <li>6. Molecular mechanisms of plant hormone signals;</li> <li>7.Molecular regulation of vegetative/generative transition;</li> <li>8. Molecular regulation of photosynthetic activity in the response to endogenous and environmental signals.</li> <li>9. Molecular regulation of plant photosynthetic productivity, the role of agrotechnical factors.</li> <li>10. Cold acclimation and freezing tolerance – basic mechanisms.</li> <li>11.Cold acclimation and freezing tolerance – environmental effects and regulations of molecular response network.</li> <li>12. Drought tolerance in crops – does it really exist?</li> </ol> <p>Laboratory classes</p> <p>Molecular response to drought –profiling of the expression of some genes during treatment by means real time PCR experiment.</p> <ol style="list-style-type: none"> <li>1.Experiment planning and setup, method description and preparation.</li> <li>2.mRNA isolation and reverse transcription.</li> <li>3.Real-time PCR reaction and data analysis</li> </ol>	
<b>Assessment method</b>	Oral and laboratory project	
<b>References</b>	<p>Taiz L., Zaigler E.(eds.) “Plant physiology” 4 Edition, 2006, Sinauer, Sunderland, ME</p> <p>Ashraf M., Harris P.J.C “Abiotic Stresses – Plant resistance through breeding and molecular approaches” 2005, FPP Press , new York,</p>	

