

<b>Subject name</b>	<b>Botany and Genetics</b>	
<b>Subject code</b>	<b>R.1sa.BOG.SI.RROAY</b>	
<b>Department</b>	<b>Plant Breeding and Seed Science</b>	
<b>Faculty</b>	<b>Agriculture and Economics</b>	
<b>Subject supervisor/Lecturer</b>	<b>Dr. Magdalena Simlat; Dr. Tomasz Warzecha</b>	
<b>General information</b>	<b>semester</b>	<b>winter</b>
	<b>ECTS credits</b>	
	<b>Lectures total</b>	<b>10 hrs</b>
	<b>Laboratories/classes</b>	<b>20 hrs</b>
<b>Objective and general description</b>	<p>The main aim of the course is to provide information about structure and function of selected plant organisms, that have a various influence on the environment and human existence, as well as basic information about inheritance rules. The course covers the following contents: Differences in the structure of pro-and eukaryotes cells. Structure and function of basic cellular structures. Characteristics of plant tissues. Structure and modification of plant organs. Sexual reproduction and the forms of vegetative propagation of plants. The history of some crop plants: some species of Brassicaceae and cereals. Biodiversity and the impact of plants importance of plants in the human community economy, protection of biodiversity. Explanation of the main genetic rules using mitosis and meiosis, main allelic and non-allelic inheritance patterns.</p> <p><b>Lectures</b></p> <ol style="list-style-type: none"> <li>1. Criteria for living organisms classification. Structure and origin of the plant cell</li> <li>2. Specialization and the origin of higher plant tissues</li> <li>3. Sexual reproduction of Angiospermae. Elements of inflorescence. Development of male and female gametophyte. Pollination biology – pollination and double fertilization in angiosperms. Classification and structure of fruit and seeds. Vegetative propagation</li> <li>4. The history of selected crop plants origin. Biodiversity and its protection</li> <li>5. The basic concepts of genetics: DNA, genes and chromosomes, DNA replication and expression of genetic information, genotype and phenotype</li> <li>6. Mendelian genetics and chromosomal basis of inheritance</li> <li>7. Extentions of Mendelian genetics and quantitative genetics</li> <li>8. Source of genetic variation.</li> </ol> <p><b>Lab classes :</b></p> <ol style="list-style-type: none"> <li>1. Principles of microscopy and observation of the living plant cell</li> <li>2. Classification and observation of selected plant tissues</li> <li>3. Plant organs: morphology and anatomy of the shoot and root - the primary structure</li> <li>4. Secondary shoot and root formation, leaf morphology and anatomy</li> <li>5. Plant storage materials</li> <li>6. Cell cycle and nuclear reproduction (mitosis, meiosis)</li> <li>7. Monohybrid and dihybrid crosses - Mendel's laws of</li> </ol>	

	<p>segregation and independent inheritance</p> <p>8. Gene mapping using two and three-point testcrosses, F2 generation</p> <p>9. Inheritance analysis of continuous traits</p> <p>10. Practical application of genetics in plant breeding</p>
<b>Assessment method</b>	written examination (test questions, and short quiz)
<b>References</b>	<p>Scott Freeman, Biological Science. Pearson Education, Inc.. 2005</p> <p>Campbell, Reece, Biology, Pearson International Edition 2008</p> <p>Gorczynski, T., Exercises in Botany. OWN W-wa.</p> <p>Pojnar E. Botany., A. R. Kraków.III script.</p> <p>K. Esau, Anatomy of plants. OWN W-wa.</p> <p>Hejnowicz Z., Anatomy and histogenesis of vascular plants. OWN W-wa.</p> <p>Jasnowska J., Jasnowski M., Radomski, J., Botany. Publisher "Brasika" Szczecin.</p> <p>E. Malinowski, The Anatomy of plants. OWN W-wa.</p> <p>Szweykowska A., Szweykowski J., Botany, Part I and II, PWN, Warsaw.</p>