

Plant Genetics and Development						
Identification number	Workload	Credit points	Term of studying	Frequency of occurrence	Duration	
MN-B-SM (PD 1)	360 h	12 CP	1 <sup>st</sup> or 2 <sup>nd</sup> term of studying	Summer term, 1 <sup>st</sup> half	7 weeks	
1	<b>Type of lessons</b>		<b>Contact times</b>	<b>Self-study times</b>	<b>Intended group size</b>	
	a) Lectures		9 h	18 h	max. 6	
	b) Practical/Lab		166 h	140 h	max. 2	
	c) Seminar		3 h	24 h	max. 1	
2	<b>Aims of the module and acquired skills</b> Students who successfully completed this module ... <ul style="list-style-type: none"> <li>• have acquired detailed knowledge on principles and methods used in plant genetics and plant molecular biology as well as about approaches to study plant development.</li> <li>• have obtained an understanding of the principles of evo-devo as the basis of exploring the evolution of traits such as flowering, flower and fruit development, axillary meristem formation and stamen maturation.</li> <li>• are able to independently plan, carry out and evaluate small scientific projects related to the topics of the module.</li> <li>• have learned how to present research results in oral and written form and to critically discuss scientific publications related to the topic of the module on a professional level.</li> <li>• are able to transfer skills acquired in this module to other fields of biology..</li> </ul>					
3	<b>Contents of the module</b> <ul style="list-style-type: none"> <li>• Genetic and phenotypic characterization of mutants</li> <li>• Expression studies (RT-PCR, in-situ hybridization)</li> <li>• Linkage mapping</li> <li>• Generation and characterization of transgenic plants</li> <li>• Epigenetics</li> <li>• Long non-coding RNAs</li> <li>• Micro RNAs</li> <li>• Mikroskopy</li> </ul> <p><i>Explanatory note:</i> The above list comprises state-of-the art genetic and molecular techniques that are commonly used in the field of plant genetics and plant molecular biology. Every student participating in this module will be confronted with a large subset of it. The exact content, however, will depend on the 6-week research project the student will work on (lab of Jun.-Prof. Dr. M. Albani: genetics, genomics, mapping by sequencing, plant development and evolution; lab of Prof. Dr. K. Theres: genetics, genomics, plant development; Dr. Angela Hay; genetics, plant development and evolution; Dr. Ivan Acosta; genetics, developmental biology, microscopy).</p>					
4	<b>Teaching/Learning methods</b> <ul style="list-style-type: none"> <li>• Lectures; Practical/Lab (Project work); Seminar; Guidance to independent research; Training on presentation techniques in oral and written form</li> </ul>					

5	<p><b>Requirements for participation</b></p> <p>Enrollment in the Master´s degree course "Biological Sciences"</p>
6	<p><b>Type of module examinations</b></p> <p>The final examination consists of three parts: 30 min oral examination about topics of the lectures and the practical/lab part (50 % of the total module mark), oral presentation (25 % of the total module mark) and seminar paper (25 % of the total module mark)</p>
7	<p><b>Requisites for the allocation of credits</b></p> <p>Regular and active participation; Each examination part at least "sufficient" (see appendix of the examination regulations for details)</p>
8	<p><b>Compatibility with other Curricula</b></p> <p>None</p>
9	<p><b>Significance of the module mark for the overall grade</b></p> <p>15 % of the overall grade (see also appendix of the examination regulations)</p>
10	<p><b>Module coordinator</b></p> <p>Prof. Dr. Maria Albani, phone 5062-380, e-mail: malbani@uni-koeln.de, albani@mpipz.mpg.de</p>
11	<p><b>Additional information</b></p> <p><b>Subject module</b> of the Master´s degree course "Biological Sciences", <b>Focus of research:</b> (P) Molecular Plant Sciences; (D) Developmental Biology</p> <p><b>Participating faculty:</b> Dr. I. Acosta, Prof. Dr. M. Albani, Dr. A. Hay, Prof. Dr. K. Theres</p> <p><b>Location:</b> The module will be held at the MPI for Plant Breeding Research, Carl-von-Linné-Weg 10, 50829 Köln</p> <p><b>Literature:</b></p> <ul style="list-style-type: none"> <li>• Griffiths, A.J.F., Wessler, F.R., Lewontin, R.C., <i>et al.</i> (2008) An Introduction to Genetic Analysis. 9<sup>th</sup> edition, W.H. Freeman</li> <li>• Leyser, O., Day, S. (2003) Mechanisms in Plant Development. Blackwell Publishing</li> <li>• Taiz, L., Zeiger, E. (2010) Plant Physiology. 5<sup>th</sup> edition, Palgrave Macmillan. Chapter 25, pp 719-753</li> <li>• Sun et al. (2015) Plant Functional Genomics, Series: Methods in Molecular Biology, Chapter 19, 381-395. <a href="http://link.springer.com/protocol/10.1007%2F978-1-4939-2444-8_19">http://link.springer.com/protocol/10.1007%2F978-1-4939-2444-8_19</a>.</li> </ul> <p><b>General time schedule:</b> Week 1-6 (Mon.-Fri.): Lectures, practical/lab and preparation for the seminar talk (topic and date will be arranged individually) as well as writing seminar paper; Week 7 (Mon.-Fri): Preparation for the oral examination</p> <p><b>Note:</b> The module contains hand-on laboratory work conducted individually and is taught in research laboratories. The module does not contain computer-based practicals/research as a main component.</p> <p><b>Introduction to the module:</b> April 05, 2018 at 2:00 p.m., MPI for Plant Breeding Research, Carl-von-Linné-Weg 10, 50829 Köln, Seminar room 2</p> <p><b>Oral examination:</b> May 28, 2018; more details will be given at the beginning of the module</p>