

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 st or 2 nd term of studying	Summer term, 1 st half	7 weeks	
1	Type of lessons		Contact times	Self-study times	Intended group size	
	a) Lectures		9 h	18 h	max. 4	
	b) Practical/Lab		166 h	140 h	max. 2	
	c) Seminar		3 h	24 h	max. 2	
2	Aims of the module and acquired skills					
	Students who successfully completed this module ...					
	<ul style="list-style-type: none"> • 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. • have obtained an understanding of the principles of evo-devo as the basis of exploring the evolution of developmental traits such as flowering and their input in life history evolution. • are able to independently plan, carry out and evaluate small scientific projects related to the topics of the module. • 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. • are able to transfer skills acquired in this module to other fields of biology.. 					
3	Contents of the module					
	<ul style="list-style-type: none"> • Genetic and phenotypic characterization of mutants • Expression studies (RT-PCR, in-situ hybridization) • Linkage mapping and mapping by sequencing • Generation and characterization of transgenic plants • Epigenetics • Long non-coding RNAs • micro RNAs <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).</p>					
4	Teaching/Learning methods					
	<ul style="list-style-type: none"> • Lectures; Practical/Lab (Project work); Seminar; Guidance to independent research; Training on presentation techniques in oral and written form 					

5	<p>Requirements for participation</p> <p>Enrollment in the Master´s degree course "Biological Sciences"</p>
6	<p>Type of module examinations</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>Requisites for the allocation of credits</p> <p>Regular and active participation; Each examination part at least "sufficient" (see appendix of the examination regulations for details)</p>
8	<p>Compatibility with other Curricula</p> <p>None</p>
9	<p>Significance of the module mark for the overall grade</p> <p>15 % of the overall grade (see also appendix of the examination regulations)</p>
10	<p>Module coordinator</p> <p>Prof. Dr. Maria Albani, phone 5062-380, e-mail: malbani@uni-koeln.de, albani@mpipz.mpg.de</p>
11	<p>Additional information</p> <p>Subject module of the Master´s degree course "Biological Sciences", Focus of research: (P) Molecular Plant Sciences; (D) Developmental Biology</p> <p>Participating faculty: Prof. Dr. M. Albani, Prof. Dr. K. Theres</p> <p>Location: The module will be held at the MPI for Plant Breeding Research, Carl-von-Linné-Weg 10, 50829 Köln</p> <p>Literature:</p> <ul style="list-style-type: none"> • Griffiths, A.J.F., Wessler, F.R., Lewontin, R.C., <i>et al.</i> (2008) An Introduction to Genetic Analysis. 9th edition, W.H. Freeman • Leyser, O., Day, S. (2003) Mechanisms in Plant Development. Blackwell Publishing • Taiz, L., Zeiger, E. (2010) Plant Physiology. 5th edition, Palgrave Macmillan. Chapter 25, pp 719-753 • Sun et al. (2015) Plant Functional Genomics, Series: Methods in Molecular Biology, Chapter 19, 381-395. http://link.springer.com/protocol/10.1007%2F978-1-4939-2444-8_19. <p>General time schedule: 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>Note: 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>Introduction to the module: April 13, 2017 at 2:00 p.m., MPI for Plant Breeding Research, Carl-von-Linné-Weg 10, 50829 Köln, Seminar room 2</p> <p>Oral examination: June 02, 2017; more details will be given at the beginning of the module</p>