

Plant Genetics and Development					
Identification number	Workload	Credit points	Term of studying	Frequency of occurrence	Duration
MN-B-SM (P 2)	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. 1
	c) Seminar		3 h	24 h	max. 4
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 to study plant development including genetics, molecular biology next generation sequencing and microscopy. • have obtained an understanding of different aspects of plant development including leaf, flower and stamen development and meiosis. • 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 • Linkage mapping • Generation and characterization of transgenic plants • Next generation sequencing approaches • CRISPR/Cas9 gene editing • Cell biology • Microscopy <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 Prof. Dr. M. Tsiantis: leaf development and diversity; lab of Dr. A. Hay: flower development and seed dispersal; lab of Dr. I. Acosta: stamen development; lab of Prof. Dr. R. Mercier: meiosis).</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 (= written project report; 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>Dr. Angela Hay, phone 5062-108, e-mail: hay@mpipz.mpg.de</p>
11	<p>Additional information</p> <p>Subject module of the Master´s degree course "Biological Sciences", Specialization: (P) Molecular Plant and Microbial Sciences</p> <p>Participating faculty: Dr. I. Acosta, Dr. A. Hay, Prof. Dr. R. Mercier, Prof. Dr. M. Tsiantis</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 (= project report); 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 12, 2021 at 1:00 p.m., MPI for Plant Breeding Research, Carl-von-Linné-Weg 10, 50829 Köln, Seminar room 2 or online (in this case, further information/link will be sent to your Smail-Account)</p> <p>Oral examination: May 31, 2021, second/supplementary examination August 06, 2021; the latter date may vary if students and module coordinator agree. More details will be given at the beginning of the module.</p>

Corona note! Depending on the Corona situation during the summer term, practical work may be skipped either totally or in part. In this case, some or all practical parts will be replaced by adequate alternatives so that (i) the workload and (ii) the principle content of the modules remained unchanged.