

Course name: *Plant Development*

**PLANT DEVELOPMENT**

ECTS	5
Course status	complementary
Course final assessment/evaluation of outcomes	exam
Prerequisites	Interest towards general plant biology

**Main field of study:** Topics to be covered include plant life forms, alternation of generations, organ development of higher plants, reproductive development, and environmental and genetic control of development. The course offers a dynamic approach to the life processes of various plant taxa, with laboratory classes and field excursion. It offers the insights into state-of-the-art scientific literature.

**field of study name (capital letters)**

Profile of study	General-academic
The code of studies (education level)	SM (master)
Semester of studies	summer
Language of instruction	English

**Course offered by:**

Name of faculty offering the course	Faculty of Agriculture and Economics
Name of department offering the course	Department of Plant Physiology, Breeding and Seed Science
Course coordinator	Renata Bączek-Kwinta

**Learning outcomes of the course:**

Symbol of outcome	Description of learning outcome	Reference to	
		main field of study outcomes	discipline

**KNOWLEDGE – student knows and/or understands:**

PLADEV_W1	Knows basic plant taxa and understands their developmental processes as a result of evolution and adaptation to environmental factors	RO2_W03, RO2_W11	RR
PLADEV_W2	Understands how and why main plant organs develop as the plant grows from an embryo to a mature flowering plant.	RO2_W03, RO2_W07	RR
PLADEV_W3	Genetic control of development	RO2_W07, RO2_W10, RO2_W11	RR

**SKILLS – student is able to:**

PLADEV_U1	Recognise plant life forms of different taxa and describe alternation of generations	RO2_U05, RO2_U06, RO2_U19	RR
PLADEV_U2	Describe development of higher plants organs, key steps in reproductive development, the role of seed dormancy, vernalisation and other issues important in plant production.	RO2_U05, RO2_U06, RO2_U19	RR
PLADEV_U3	To apply the knowledge on genetic control of development in some breeding programmes	RO2_U12, RO2_U19	RR

**SOCIAL COMPETENCE- student is ready to:**

PLADEV_K1	Schedule the small-scale laboratory experiment on seeds and seedlings	RO2_K02, RO2_K03, RO2_K04	RR
PLADEV_K2	Use basic microscopic techniques for plant tissue examination	RO2_K03, RO2_K07	RR
PLADEV_K3	Find specific molecular pathway in plant molecular database	RO2_K03, RO2_K07	RR

**Teaching contents:**

<b>Lectures</b>	<b>15</b>	<b>hours</b>
<ol style="list-style-type: none"> <li>1. Plants as you can see – plant life-form, life cycle, some model plants, plant ancestors.</li> <li>2. Bryophytes, their life cycle and adaptation to environmental conditions. <i>Physcomitrella</i> as a model plant.</li> </ol>		

Topics of the lectures	<p>3. Pteridophytes – taxonomy and developmental cycles.</p> <p>4. Gymnosperms as first flowering plants.</p> <p>5. Angiosperms – seed protection means success.</p> <p>6. Pollination and fertilization rules important in agricultural production – self-incompatibility.</p> <p>7. Root and shoot development – molecular mechanism of organ generation.</p> <p>8. Senescence as a part of life.</p>
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Accomplished learning outcomes	<i>Exam; the grade is 60% of contribution in the final grade</i>
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Verification methods, rules and criteria of outcome assessment	<p><i>Written test, mixed version.</i></p> <p><i>Grade E (2.0) &lt; 50%</i></p> <p><i>Grade D (3.0) 50%</i></p> <p><i>Grade C (3.5) 60%</i></p> <p><i>Grade B (4.0) 70%</i></p> <p><i>Grade B+ (4.5) 80%</i></p> <p><i>Grade A (5.0) 90-100%</i></p>
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<b>Classes</b>	<b>30</b>	<b>hours</b>
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Topics of the classes	<p>1-15 Laboratory classes</p> <p>Leaf growth of monocots and dicots. Impact of temperature and light on plant growth and development. Impact of auxin, gibberelin and cytokinin on plant growth and development. Practical use of hormones and growth regulators.</p> <p>Seed dormancy and its breakdown. Impact of plant growth regulators, oxidants and natural terpenoids on seed germination.</p> <p>Plant movements: tropisms, nastic movements, taxis.</p> <p>16-25 Field trip - Botanic Garden - identification of different developmental phenomena</p> <p>26-30 Students' presentations on different aspects of developmental issues. KEGG database - case study.</p>
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Accomplished learning outcomes	<i>Classes reports</i>
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Verification methods, rules and criteria of outcome assessment	<p><i>1. Grades for accomplished tasks realised individually or as a teamwork. The assessment will be based on the efficiency and organization of a team and skills in using the source materials.</i></p> <p><i>2. Correctness of tasks performance, tests.</i></p> <p><i>Classes grade is 40% of the contribution in the final grade.</i></p>
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<b>Seminars</b>	<b>...</b>	<b>hours</b>
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Topics of the seminars	
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Accomplished learning outcomes	<i>symbol of learning outcomes of the seminars</i>
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Verification methods, rules and criteria of outcome assessment	<i>together with participation in the final assessment (in %)</i>
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**References:**

Basic	<p><i>1. Lecture notes, classes handouts</i></p> <p><i>2. Taiz L., Zeiger E. (eds) Plant Physiology. 2006, Sinauer Associates, Inc., Sunderland.</i></p>
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Supplementary	
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**Structure of learning outcomes:**

Discipline: # RR	5	ECTS**
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Discipline: # (provide appropriate symbol - if the course relates to more than one academic discipline)	...	ECTS**
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**Structure of student activities:**

Contact hours	51	hours	2	ECTS**
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including:	lectures	15	hours
	classes and seminars	30	hours
	consultations	4	hours
	participation in research	...	hours
	mandatory traineeships	...	hours
	participation in examinations	2	hours

e-learning		hours	ECTS**
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student own work	75	hours	3	ECTS**
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Syllabus valid from the academic year 2021/2022

\* where 10 hours of classes = 1 ECTC (in case of 15 h → 2 ECTS)

\*\* stated with an accuracy to 0.1 ECTS, where 1 ECTS = 25 - 30 hours of classes

# academic discipline code: RR - agriculture and horticulture