

		Teaching	Guide		
	Identifyi	ng Data			2021/22
Subject (*)	Plant Response to Adverse Con	ditions		Code	610G02030
Study programme	Grao en Bioloxía				
		Descrip	tors		
Cycle	Period	Yea	r	Туре	Credits
Graduate	2nd four-month period	Fourt	th	Optional	6
Language	Spanish				, ,
Teaching method	Face-to-face				
Prerequisites					
Department	Bioloxía				
Coordinador	Bernal Pita da Veiga, María de lo	os Ángeles	E-mail	angeles.bernal	@udc.es
Lecturers	Bernal Pita da Veiga, María de lo	os Ángeles	E-mail	angeles.bernal	@udc.es
	Carrillo Barral, Néstor			n.carrillo@udc.	es
	Diaz Varela, Jose			jose.diaz.varela	@udc.es
Web		!			
General description	Stress, plant disorder and diseas	se. Water stress a	nd flooding. Oxic	lative stress. Stress b	y excessive light or dark. Stress by
	extreme temperatures. Stress by	mineral nutrients	. Plant diseases.	Types of pathogens.	Pathogenesis: Infection and
	colonization processes. Plan def	ense and resistar	nce. The physiolo	gy of the diseased pla	ant. Plant pests. Response to
	herbivores.				



Contingency plan	1. Modifications to the contents
	They will not modify the contents, since they are basic for the training of a Graduated in Biology
	2. Methodologies
	When treating of a matter of the second cuatrimestre will be able to give three situations:
	A - To normal face-to-face Teaching, if the access to the Faculty was allowed in a schedule and aforo like the ones of
	before the pandemia. In this case would go back to a totally face-to-face system.
	B- Hybrid teaching or semipresencial, if the access to the Faculty was restricted in schedule or aforo. In this case there
	would be a combination of face-to-face and on-line teaching.
	C- No face-to-face, if the access to the Faculty was totally forbidden in this cuatrimestre. In this case the teaching would be
	totally no face-to-face
	*Teaching methodologies that are maintained
	In the case A, all.
	In the case B, the masterclasses would give of rotatory face-to-face way (aforo face-to-face limited) and to the time the
	class transmision on-line with Teams. In the case of the practices, would reduce the aforo in the laboratory and part of the
	practices would give on-line with ad hoc materials generated by the professors. The groups reduced would be partly
	face-to-face partly on-line.
	*Teaching methodologies that are modified
	In the case C, masterclasses, practical and groups reduced would manage totally on-line.
	3. Mechanisms for personalized attention to students
	Email, tutorías by Teams and forums in Moodle, with daily attention in the case of the email and forums, and previous
	request of the student in the case of the tutorías by Teams.
	4. Modifications in the evaluation
	In the case A, face-to-face. In the cases B and C, on-line evaluation (Moodle and other institutional tools).
	*Evaluation observations:
	5. Modifications to the bibliography or webgraphy
	In the case A, any. In the cases B and C: if it was possible alternative books and/or additional in electronic format to which
	had access from the start of this cuatrimestre (conditioned to that publish in open in the next months or there is institutional
	subscription), and in any additional material case ad hoc generated by the professors.
	(ii) planned Adaptation in the centre for the cases in which it surpass the aforo of the classroom assigned for the matter:
	Attribution of two or more classrooms to the matter and impartición of the class through TEAMS for the students that was
	not in the classroom with the professor

	Study programme competences / results
Code	Study programme competences / results
A4	Obter, manexar, conservar e observar especímenes.
A9	Identificar e utilizar bioindicadores.
A10	Avaliar actividades metabólicas.
A11	Identificar e analizar material de orixe biolóxica e as súas anomalías.
A17	Realizar bioensaios e diagnósticos biolóxicos.
A19	Analizar e interpretar o comportamento dous seres vivos.
A26	Deseñar experimentos, obter información e interpretar os resultados.
A29	Impartir coñecementos de Bioloxía.
A30	Manexar adecuadamente instrumentación científica.
A31	Desenvolverse con seguridade nun laboratorio.
B1	Aprender a aprender.
B2	Resolver problemas de forma efectiva.
B3	Aplicar un pensamento crítico, lóxico e creativo.
B4	Traballar de forma autónoma con iniciativa.
B5	Traballar en colaboración.



B6	Organizar e planificar o traballo.
B7	Comunicarse de maneira efectiva nunha contorna de traballo.
B8	Sintetizar a información.
B9	Formarse unha opinión propia.
B10	Exercer a crítica científica.
B11	Debater en público.
B12	Adaptarse a novas situacións.
B13	Comportarse con ética e responsabilidade social como cidadán e como profesional.

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A30 B6		A17	B3	
		A26	B4	
A94		A30	B6	
AST		A31		

	Contents
Торіс	Sub-topic



Topic 1. Introduction: plant responses to adverse conditions.	Different aspects of the proposed topics.
Topic 2. Water stress and flooding.	
Topic 3. Stress by light.	
Topic 4. Stress by extreme temperatures.	
Topic 5. Stress by nutrients.	
Topic 6. Introduction to plant diseases and plant pathogens.	
Topic 7. Pathogenesis: Processes of infection and	
colonization by pathogens.	
Topic 8. Plant defense and resistance against pathogens.	
Topic 9. Physiology of the diseased plant.	
Topic 10. Plant pests and response to herbivores.	
Practicals	Practicals about the topics of the subject.

Planning	9		
Competencies /	Teaching hours	Student?s personal	Total hours
Results	(in-person & virtual)	work hours	
B1 B9 B10	21	52.5	73.5
A9 A10 A11 A19 A26	7	28	35
A29 B1 B2 B3 B4 B5			
B6 B7 B8 B9 B10 B11			
B12 B13			
A4 A9 A10 A11 A17	4.5	0	4.5
A19 A26 A30 A31			
A17 A19 A26	14	21	35
	2	0	2
	Competencies / Results B1 B9 B10 A9 A10 A11 A19 A26 A29 B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12 B13 A4 A9 A10 A11 A17 A19 A26 A30 A31	Results (in-person & virtual) B1 B9 B10 21 A9 A10 A11 A19 A26 7 A29 B1 B2 B3 B4 B5 7 B6 B7 B8 B9 B10 B11 1 B12 B13 44 A9 A10 A11 A17 A19 A26 A30 A31 14	Competencies / ResultsTeaching hours (in-person & virtual)Student?s personal work hoursB1 B9 B102152.5A9 A10 A11 A19 A26728A29 B1 B2 B3 B4 B5B6 B7 B8 B9 B10 B11

(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

	Methodologies
Methodologies	Description
Guest lecture /	Oral exhibition of the subject complemented with presentations in Power Point, videos and/or diagrams of blackboard. During
keynote speech	the development of the subject we make questions to the student so that thinking on them and oral response, previously to his
	explanation by the professor.
Seminar	Technician of work in group that has like purpose the intensive study of a subject. It will realise in groups very reduced of 25
	students
Mixed	It will consist of two parts, in which they will evaluate the knowledges purchased so many theorists like practical. The mixed
objective/subjective	proof can to include questions to develop, type test or problems
test	
Laboratory practice	Methodology that allows that the students learn sure enough through the realisation of activities of practical character, such
	like demonstrations, exercises, experiments and investigations.

	Personalized attention
Methodologies	Description
Seminar	The students, in groups of 25, will gather with the teacher for to preparation of a work of seminar. In schedule of tutorías, each
	student will be able to comment with the teacher the course of the work, as well as all the doubts that present him . For those
	students with official part-time dedication, the seminar sessions might be replaced by a written work, if the student requires it.



		Assessment	
Methodologies	Competencies /	Description	Qualification
	Results		
Seminar	A9 A10 A11 A19 A26	The activities developed during the seminars will be evaluated of way continua by the	30
	A29 B1 B2 B3 B4 B5	teacher.	
	B6 B7 B8 B9 B10 B11		
	B12 B13		
Mixed	A4 A9 A10 A11 A17	Probe of the theoretical and practical knowledges.	70
objective/subjective	A19 A26 A30 A31	55% theorist.	
test		20% practical.	

Assessment comments

To pass the subjet the students have to obtain at least 4 points in the mixed proof (and in each one of his two parts, theoretical and practical) and in seminars. The average of all the activities has to be as minimum of 5; If it resulted to be of 5 or more points, but obtained less than 4 points in one of the parts of the mixed proof, the final note will be of 4,9 (fall). In the second opportunity (July), will realise only the mixed proof, the qualifications obtained in the seminars keep of the first opportunity. They will be considered like NON PRESENTED those students that no present to the mixed proofs.

Attendance to practicals is compulsory. If a student does not attend to one or two sessions of the practicals, he/she will have a penalty of one and two points, respectively, to be substracted from the score of the ?proba mixta?. If the student does not attend to three or more sessions of the practicals, he/she will get a fail as the final score in the course.

For those students with official part-time dedication and academic exemption, the seminar sessions might be replaced by a written work, if the student requires it.

The students with top marks in the first evaluation period (June) will have priority to achieve MATRÍCULA DE HONOR (qualification with Honors) For to the students that request the ANNOUNCEMENT ADVANCED OF

DECEMBER, will apply the rule, as which

rixe the educational guide of the course.

 Agrios, G. N (2005). Plant pathology, 5^a Ed Academic Press. Buchanan et al. (2015). Biochemistry and molecular biology of plants, 2nd edition. Wiley-Blackwell ? ASPB Dictionary M. (2020). Molecular Biology Plant Patholecular Discoversion of the plant of the pla
Distinger, M. (2020) Malageber Diset Dath James, Dise Osiastifia, Dath isters
- Dickinson, M. (2003). Molecular Plant Pathology Bios Scientific Publishers.
- Larcher, W (2003). Physiologycal Plant Ecology. Springer Verlag
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- Ortolá, AG (2001). Ecofisiología Vegetal.
- Reigosa, MJ., Pedrol, N., Sánchez, A (2004). La Ecofisiología vegetal. Thomsom
- Bhatla, S.C. & amp; Lal, M.A. (2018). Plant physiology, development and metabolism. Springer
- Smith, A.M., Coupland, G., Dolan, L., Harberd, N., Jones, J., Marin, C., Sablowski, R. & amp; amp; (2009). Plant
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- Taiz, L. y Zeiger, E. (2010). Plant Physiology, 5th Edition Sinauer Associates.
- Taiz, L., Zeiger, E., Moller, A.M. & amp; Murphy, A. (2015). Plant Physiology and Development. Sinauer associates
Massachusets



Complementary	- Trigiano, R.N., Whindham, M.T. & amp; amp; Windham, A.S. (2007). Plant Pathology: Concepts and Laboratory
	Exercises. 2nd ed CRC Press LLC.
	- Schumann, G.L. y D'Arcy, C.J. (2006). Essential Plant Pathology APS Press.
	- Buchanan, B. B., Gruissem, W. & amp; amp; Jones, R. L. (2000). Biochemistry and molecular biology of plants
	ASPP
	- Walters, D.R. (2011). Plant defense. Wiley-Blackwell.
	- Parker, J. (2009). Molecular aspects of plant disease resistance Blackwell Publishing Ltd.
	- Madhava, KV., Raghavendra, AS., Janardhan, K (2006). Physiology and Molecular Biology of Stress Tolerance.
	Springer
	- Shabala, Sergey (2012). Plant Stress Physiology. Cabi
	- Huang, B (2006). Plant Environment Interactions. CRC Taylor & amp; amp; Francis
	- Mooney, HA., Winner, WE., Pell, EV (2006). Response of plants to multiple stresses. Academic Press

Recommendations	
Subjects that it is recommended to have taken before	
Plant Physiology I/610G02027	
Plant Physiology II/610G02028	
Applied Plant Physiology /610G02029	
Subjects that are recommended to be taken simultaneously	
Subjects that continue the syllabus	
Other comments	
Program Green Campus	
Empower of SciencesTo help to achieve some sustainable immediate surroundings	
and fulfil with the point 6 of the Environmental Statement of the faculty of	
Sciences (2020), the documentary works that realise in this matter:to. They will request	
mostly in virtual format and computer supportb. To realise in	
paper:-they will not employ	
plastic-will realise	
impressions to double expensive-will employ paper	
recycled-will avoid the	
realisation of draftsTo Environmental Statement is available	
in:https://ciencias.udc.es/images/Facultade/Green_Campus/Regulamento_Comit%C3%A9_Green_Campus_FCiencias.pdf	

(*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.