

**COURSE GUIDE (GUÍA DOCENTE CURSO): 2017-18**

<b>COURSE DETAILS (DATOS BÁSICOS DE LA ASIGNATURA)</b>			
Name (Asignatura):	Agronomical bases of protected crops (esp. CP)		
Code (código de asignatura):	70782209	Plan:	Máster en Horticultura Mediterránea bajo Invernadero
Academic year (Año académico):	2017-18	Level (Ciclo formativo):	Official Master
Course (Curso de la titulación):	1	Type (Tipo):	Optative
Semester (Duración):	First semester		
<b>TIME DISTRIBUTION (DISTRIBUCIÓN HORARIA DE LA ASIGNATURA SEGÚN NORMATIVA)</b>			
ECTS (Créditos):	3		
Total time in hours (Total Horas):	75		
<b>USE OF VIRTUAL PLATFORM (UTILIZACIÓN DE LA PLATAFORMA VIRTUAL):</b>	Multimodal		

<b>LECTURER DETAILS (DATOS DEL PROFESORADO)</b>			
Name (Nombre):	<b>Bonachela Castaño, Santiago</b>		
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### ELEMENTS OF INTEREST FOR LEARNING THIS COURSE (ELEMENTOS DE INTERÉS PARA EL APRENDIZAJE DE LA ASIGNATURA)

#### Justification of contents (Justificación de los contenidos)

Protected (mostly greenhouses) crops are usually high-value crops grown intensively with the main aim of obtaining a high production of high quality products. For optimal production, these crops systems usually require specific cultivars and crop management techniques and, therefore, they need specific agronomical knowledge and know-how about their growth, development and production, and about how these parameters are affected by the main environmental factors (greenhouse microclimate).

In regions with warm climates, such as the Mediterranean basin, low-cost greenhouses predominate. These greenhouses are covered with plastic film, have no active climate control systems, and mostly contain soil-grown crops. In Mediterranean areas, the main greenhouse microclimate variables influencing crop behaviour are usually below or above the optimum range: low air temperature, high air humidity, low PAR radiation CO<sub>2</sub> air content from November to February; and high air temperature, low air humidity, low PAR radiation CO<sub>2</sub> air content from April to September. Therefore, the greenhouse microclimate usually reduces crop productivity and fruit quality.

#### Other related courses (Materia con la que se relaciona en el Plan de Estudios)

- Gestión del microclima. Respuesta de los cultivos

#### Minimum knowledge required for following this course (Conocimientos necesarios para abordar la Asignatura)

- Basic knowledge about agronomy (mostly crop production)
- Basic computer skills
- Good English language level (especially reading)

### COMPETENCIAS (Competencias)

#### General competencies (Competencias Generales)

*General objectives of the Almería University (Competencias Transversales de la Universidad de Almería)*

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<ul style="list-style-type: none"> <li>Ability to use information and communication technologies (TICs)</li> </ul>
<i>Basic competencies (Competencias Básicas)</i> <ul style="list-style-type: none"> <li>To get and understand knowledge</li> </ul>
<b>Specific competencies (Competencias Específicas desarrolladas)</b>
<ul style="list-style-type: none"> <li>To know the agronomical basis of protected crops</li> </ul>
<b>LEARNING OBJECTIVES/OUTCOMES (OBJETIVOS/RESULTADOS DEL APRENDIZAJE)</b>
<ul style="list-style-type: none"> <li>Students have to be able to get specific knowledges about growth, development and production of protected crops, and about how these crops respond to the environment (greenhouse microclimate) in order to optimize crop management techniques.</li> </ul>
<b>COURSE PLANNING</b>
<b>Contents</b>
<b>Module I. <u>Growth, development and production of protected crops</u></b> Chapter 1. <b>Basic concepts of growth and development of protected crops:</b> Chapter 2. <b>Basis of crop production in protected crops</b>
<b>Module II. <u>Bases of root system of protected crops</u></b> Chapter 1. <b>Root distribution and functioning</b> Chapter 2. <b>Root characterization. Factors influencing growth, development and distribution of roots of protected crops.</b>
<b>Module III. How protected crops respond to the main microclimate variables?</b> Chapter 1. <b>Temperature and crop responses</b> Chapter 2. <b>Radiation and crop responses</b> Chapter 3. <b>The influence of CO<sub>2</sub> concentration and other microclimate variables in protected crops.</b>
<b>Methodology and teaching activities (Metodología y Actividades Formativas)</b>
<ul style="list-style-type: none"> <li>Seminars and evaluation; practical cases; demonstration of specific procedures; practical exercises and reports, laboratory practices; debates; practical case study.</li> </ul>
<b>Teaching innovation activities (Actividades de Innovación Docente)</b>

<b>EVALUATION SYSTEM (PROCEDIMIENTO DE EVALUACIÓN DE LAS COMPETENCIAS)</b>
<b>Evaluation criteria</b>
<ul style="list-style-type: none"> <li>Student assistance and participation in in-class/online activities (15 % of the total score)</li> <li>Evaluation of case studies, reports, exercises and other programmed activities (35% of the total score)</li> </ul> <p>Within these two parts the competence “Ability to use information and</p>

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communication technologies (TICs)” is assessed.

- Final test (50% of the total score). The competencies "to get and understand knowledge" and "to know the agronomical basis of protected crops" are assessed with this procedure.

#### Instruments of student assessment and control

- Online test of case studies
- Exercises
- Class assistance and questioning
- Use of the virtual platform
- Reports

### BIBLIOGRAPHY (BIBLIOGRAFÍA)

#### Recommended bibliography (bibliografía recomendada)

##### *Basic bibliography (Básica)*

- Integrated Greenhouse Systems for Mild Climates. Christian von Zabeltitz. Springer, Heidelberg.
- Principles of Horticultural Physiology. E.F. Durner. CABI 2013.
- Greenhouse Technology and Management. N. Castilla. CABI

##### *Additional bibliography (Complementaria)*

- Greenhouse ecosystems. Ecosystems of the world 20. G. Stanhill and H.Z. Enoch. Elsevier.
- Soil Culture: theory and Practice. M Raviv & J.H. Leith. Elsevier.

Bibliography existent in the library of the University of Almería

<http://almirez.ual.es/search/x?SEARCH=70782209>

### WEB ADRESSES (DIRECCIONES WEB)

- <http://www.juntadeandalucia.es/agriculturaypesca/ifapa/web/ifapa/productos/publicacionesypatentes>  
*Manejo del clima en el invernadero mediterráneo. IFAPA*

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