



Program	13IF – [Bachelor’s Degree in Forest Engineering] and 13MN – [Bachelor’s Degree in Natural Environment]
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Course number and name	
Number	[135001759] and [135002757]
Name	Multiple use of natural products
Semester	S7 [(September-January)]

Credits and contact hours	
ECTS Credits	3
Contact hours	30

Coordinator's name	Carlos Calderón (carlos.calderon@upm.es)
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Specific course information	
Description of course content	
Natural products include a variety of products ranging from food (nuts, fruits, mushrooms, honey, game, gums); food additives (spices, herbs, flavorings, sweeteners); fibers (for furniture, clothing, construction); fragrances; seeds; resins; oils, even medicinal plants. We will approach the uses of natural products from the point of view of sustainability and the responsible use in accordance with the sustainable development goals (SDGs)	
List of topics to be covered	
<ol style="list-style-type: none"> 1. Introduction. Identification of Potential NPs. 2. Active Principles in NPs. 3. History and classification of NPs. 4. Production and marketing. 5. Raw Material and plant processing. 6. Industrial utilization of NPs. Essential oils. 7. Industrial uses of NPs. Cosmetic industry 8. Industrial uses of NPs. Food processing industry 9. Industrial uses of NPs. The pharmaceutical sector 10. Uses of NPs. Perfume and cosmetic sector. 11. Other uses of NPs. 12. Chemical Analysis and Quality control of NPs. 13. Economic Valuation of Environmental Services Provided by Dye Plants 14. Research, innovation, entrepreneurship and sustainability in new natural products 	
Prerequisites or co-requisites	
None.	
Course category in the program	



R (required)

E (elective)
(elective courses may not be offered every year)

Specific goals for the course

Specific outcomes of instruction

CE 4.6 - Ability to know, understand and use the principles of: Forestry non-wood raw materials.

CE 4.7 - Ability to know, understand and use the principles of: Industrial processes of non-wood products: cork, resin, and essential oils.

CT 10 - Environmental awareness: It is the set of knowledge, abilities, skills and attitudes, useful for interacting with the environment, ethically, responsibly and sustainably, in order to avoid or lessen the negative effects produced by the inappropriate practices caused by human activities, and to promote the benefits that professional activity can generate in the environmental field, taking into account its economic and social implications.

CT 5 - Bibliographic search and analysis of documentation.

RA540 - Attainment of competences in the field of medicinal and aromatic plants.

Bibliography and supplemental materials

- Industrial Uses of MAPs: Cosmetic Industry. MP Arraiza, C Calderón-Guerrero, SC Guillén... Medicinal and Aromatic Plants: The Basics of Industrial Application (Frontiers in Horticulture Book 1) - Kindle edition by Paz Arraiza, M., González-Coloma, A., Calderón-Guerrero. C. (2017)
- Active principles in MAPs. MP Arraiza, C Calderón-Guerrero, SC Guillén... - Medicinal and Aromatic Plants: The Basics of Industrial Application (Frontiers in Horticulture Book 1) - Kindle edition by Paz Arraiza, M., González-Coloma, A., Calderón-Guerrero. C. (2017)
- Industrial Uses of MAPs: The Pharmaceutical Sector. MP Arraiza, C Calderón-Guerrero, SC Guillén... - Medicinal and Aromatic Plants: The Basics of Industrial Application (Frontiers in Horticulture Book 1) - Kindle edition by Paz Arraiza, M., González-Coloma, A., Calderón-Guerrero. C. (2017)
- Chemical Analysis and Quality Control of MAPs. MP Arraiza, C Calderón-Guerrero, SC Guillén... - Medicinal and Aromatic Plants : The Basics of Industrial Application (Frontiers in Horticulture Book 1) - Kindle edition by Paz Arraiza, M., González-Coloma, A., Calderón-Guerrero. C. (2017)
- Other Uses of MAPs. MP Arraiza, C Calderón-Guerrero, SC Guillén... Medicinal and Aromatic Plants: The Basics of Industrial Application (Frontiers in Horticulture Book 1) - Kindle edition by Paz Arraiza, M., González-Coloma, A., Calderón-Guerrero. C. (2017)



Teaching methodology			
<input checked="" type="checkbox"/> lectures	<input type="checkbox"/> problem solving sessions	<input type="checkbox"/> collaborative actions	<input checked="" type="checkbox"/> laboratory sessions
Other:			