

Course Unit	Production of aromatic and medicinal plants			Field of study	Pharmaceutical Sciences	
Master in	Natural Products and Bioprospecting			School	School of Agriculture	
Academic Year	2023/2024	Year of study	1	Level	2-1	ECTS credits 6.0
Туре	Semestral	Semester	1	Code	5012-740-1103-00-23	
Workload (hours)	162	Contact hours	T 30 TP T - Lectures; TP - Lectures a	- PL 6 T	C 20 S 4 solving, project or laboratory; TC	Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Manuel Ângelo Rosa Rodrigues Name(s) of lecturer(s)

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:

- 1. To master the cultural practices of the herbs, trees and shrubs grown as medicinal and aromatic plants, such as seeding, planting, pruning, soil management, fertilization, crop protection, etc.
- To understand the stucture, morphology and the life cycle of herbs, trees and shrubs which have interest in phytopharmacy. To know the agroecological requirements of herbs, tree and shrub species which have interset in phytopharmacy. To search for alternatives to the conventional crops or new uses for the current crops, such as raw-materials for biofuels, fibers, etc. Capacity to implement the best management practices in order to reduce environmental impacts. 4

- 6. To identify gaps in knowledge and apply for site-specific experimental work.
  7. To discuss the international issue of wild harvesting versus cultivation and its ecological, economic and social implications.
  8. To integrate the cultivation of medicinal and aromatic plants in sustainable agricultural systems such as organic farming, biodynamic farming, .....

#### Prerequisites

Before the course unit the learner is expected to be able to:

- 1. General knowledge on botany
- General knowledge on plant physiology
   General knowledge on soils and soil fertility

## Course contents

Production of aromatic and medicinal plants shrubs and trees (hops, lemongrass, mint, verbena, rosemary, lavender, jasmine, medicinal cannabis, strawberry tree, ecological requirements. Vegetative cycle, phenology and development, cultural and sustainable production techniques.

### Course contents (extended version)

- 1. Herbs, trees and shrubs which have interest to phytopharmacy
  - Definitions and concepts
  - Structure and morphology
- Structure and morphology
  Growth cycle
  Floral biology, flowering, pollination and fertilisation
  Plant breeding in herbs, tree and shrub species
  Cropping tecniques (seeding, plantation, irrigation, pruning, fertilisation, crop protection).
  Energy crops for biodiesel, bio-ethanol and biomass production and natural fibers
  Political framework, economic and environmental
  National ecological potential for bioenergy production and other non-food crops
  Agro-ecological adaptation
  Sustainability of agroecosystems
  Environmental impacts associated with agricultural activity. Alternative farming systems.
  The agri-environmental policies in the herbaceous sector
  Wild-harvesting versus cultivation of medicinal and aromatic plants.

#### Recommended reading

- González, A. R., Román, V. L., Castro, M. 2009. Plantas Medicinais do Norte de Portugal e Galiza. Mel Editores.
   Mathe, A. 2015. Medicinal and Aromatic Plants of the World: Scientific, Production, Commercial and Utilization Aspects. Springer, The Netherlands.
   Ubillos, M. A. M., Montalbán, J. M. 2009. Plants aromáticas gastronómicas. Mundi-Prensa, Madrid.
   Simmonds, M.; HoWes, M.-J.; Irving, J. 2017. The Gardener's Companion to Medicinal Plants: An A-Z of Healing Plants and Home Remedies. Royal Botanic Gardens Kew
- 5. Jackson, D., Looney, N., Morley-Bunker, M., Thiele, G. 2011. Temperate and subtropical fruit production. 3nd Ed., Cambridge Univ. Press, Uk.

#### Teaching and learning methods

Introduction of theoretical contents by using audio-visual equipment and blackboard. Establishment of field experiments. Plant material sampling and processing. Seminar preparation, from experimental results and bibliographical searching. Results presentation as written reports and oral communications. Technical study visits.

## Assessment methods

- 1. Alternative 1 (Regular, Student Worker) (Final) Final Written Exam 50% (Written exam of the theoretical component)

- Final Written Exam 50% (Written exam of the theoretical component)
  Practical Work 50% (Experimental studies and reports carried out in class or test replacement for worker-students.)
  Alternative 2 (Regular, Student Worker) (Supplementary)
  Final Written Exam 50% (Written exam of the theoretical component)
  Practical Work 50% (Experimental studies and reports carried out in class or test replacement for worker-students.)
  Alternative 3 (worker-students) (Student Worker) (Special)
  Final Written Exam 50% (Written exam of the theoretical component)
  Practical Work 50% (Experimental studies and reports carried out in class or a substitution test.)
  Alternative 4 (finalist students) (Regular, Student Worker) (Special)
  Final Written Exam 50% (Written exam of the theoretical component)
  Practical Work 50% (Experimental studies and reports carried out in class or a substitution test.)
  Alternative 4 (finalist students) (Regular, Student Worker) (Special)
  Final Written Exam 50% (Written exam of the theoretical component)
  Practical Work 50% (Experimental studies and reports carried out in class or a substitution test.)

# Language of instruction Portuguese, with additional English support for foreign students.

Electronic validation			
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25-01-2024	01-02-2024	01-02-2024	01-02-2024