UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze Agrarie, Alimentari e Forestali
ACADEMIC YEAR	2020/2021
MASTER'S DEGREE (MSC)	AGRICULTURAL PRODUCTIONS AND TECHNOLOGIES
INTEGRATED COURSE	PLANTS MANAGEMENT IN URBAN ENVIRONMENT - INTEGRATED COURSE
CODE	20939
MODULES	Yes
NUMBER OF MODULES	2
SCIENTIFIC SECTOR(S)	AGR/03, AGR/02
HEAD PROFESSOR(S)	TUTTOLOMONDO TERESA — Professore Ordinario — Univ. di PALERMO
OTHER PROFESSOR(S)	MOTISI ANTONIO — Professore Ordinario — Univ. di PALERMO TUTTOLOMONDO TERESA — Professore Ordinario — Univ. di PALERMO
CREDITS	12
PROPAEDEUTICAL SUBJECTS	
MUTUALIZATION	
YEAR	1
TERM (SEMESTER)	2° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	**MOTISI ANTONIO** Monday 8:00 14:00 Studio Prof. Motisi presso il Dipartimento SAAF Wednesday 11:00 13:00 Sede CdL Viticoltura ed Enologia Thursday 09:00 12:00 Sede CdL Viticoltura ed Enologia **TUTTOLOMONDO TERESA** Tuesday 12:00 14:00 Stanza docente, Edificio 4, ingresso L, secondo piano. Thursday 12:00 14:00 Stanza docente, Edificio 4, ingresso L, secondo piano.

DOCENTE: Prof.ssa TERESA TUTTOLOMONDO

PREREQUISITES	The dynamics of ecophysiological processes of vegetation in relation to environmental variables and their role on urban microclimate are central to this course. Knowledge requirements consist of basic courses of mathematics, physics, inorganic and organic chemistry, botany (morphology and physiology), biochemistry, agronomy and crop ecology and fundamental concepts of plant genetics.
LEARNING OUTCOMES	Knowledge and understanding Knowledge of ecological factors and their influence on herbaceous and woody plants in the urban environment. Knowledge of the effects of urban environment on sites climatology. Knowledge of main climatic types prevailing in the urban environment. Knowledge of the most pressing management issues of urban vegetation in relation to ecological factors. Applying knowledge and understanding Competences in the evaluation of environmental requirements aiming to the choice of the suitable species to adopt in the urban environment. Competences in the usage of ornamental plants, isolated or in communities, aiming to the mitigation of urban microclimate. Competences on urban vegetation management techniques in relation the environment. Making judgements Analysis capabilities on plant-environment relations both of individual plants and grouped in communities (parks, urban forests, urban gardens) Ability to formulate and apply urban vegetation management criteria in relation to environmental variables for the mitigation of urban microclimate through the use of vegetation. Communication Ability to express and formulate hypotheses and projects and to support the adoption of plant species suitable to affect/mitigate the urban microclimate. Learning skills Ability to gather relevant information and data on urban environment. Knowledge of reputable sources of information and environmental data at the urban landscape level. Ability to search and acquire fundamental environmental variables and usage of information and knowledge support systems.
ASSESSMENT METHODS	Oral exam consists of a colloquium aiming to ascertain the level of competences and knowledge acquired within the course. Final assessment will be based on the average of marks awarded for the two modules. The highest score (30 with honours) will be awarded to the student who has a high assessment capacity, excellent skills in the application of the knowledge gained on the course through examples and/or models, excellent capacity to provide solutions to the main problematic issues and to an excellent command of technical language. The lowest score (18) will be awarded to the student who proves to have a low assessment capacity, poor ability to put into practice the knowledge gained on the course through examples and/or models, poor ability to provide solutions to the main problematic areas and poor use of technical language. Exam questions will aim to assess: a) knowledge acquired, b) ability to elaborate on course subjects, c) ability to adequately express with a good degree of synthesis and effectiveness. In detail, oral assessment will be performed as follows: a) knowledge and comprehension acquired within the course will be assessed through specific questions on main environmental variables and their interaction with ornamental plants.; b) the ability to elaborate on course subjects will be assessed within at least one of the following scopes: b1) ability to express autonomous reasoning about the interactions between urban environment and vegetation; b2) overall comprehension of their role within the discipline and ability to mitigate urban microclimate through the use of vegetation; b3) elaborate a general framework integrating course contents within a real-world example, with particular reference to the analysis of urban systems in relation to the environmental, socio-economic and cultural context. c) evaluation of communication skills will give a minimum grading when the student is able communicate with the specific language of the professional field but not in a fully structured expression. Maximum evaluation will be given when a full control of the field-specific language will be shown together with a distinct knowledge of the professional lexicon.
TEACHING METHODS	Classroom lectures, practical sessions and field trips.

MODULE
TREE HERITAGE MANAGEMENT IN URBAN ENVIRONMENT

Prof. ANTONIO MOTISI

SUGGESTED BIBLIOGRAPHY

Libri
- Bettini V. Ecologia urbana. L'uomo e la citta. UTET, 2004..
- Hruska K. Ecologia urbana. Cuen, 2000.
- Fuligni P. & Rognini P. Manuale di ecologia urbana e sociale. Franco Angeli, 2005.
- Gisotti G. Ambiente urbano. Introduzione all'ecologia urbana. Dario Flaccovio editore, 2007.
- Konijnendijk C., Nilsson K., Randrup T., Schipperijn J. (eds) Urban Forests and Trees. Springer, Berlin, Heidelberg. https://link.springer.com/book/10.1007/3-540-27684-X

Articoli su rivista selezionati
- Stagoll K., Lindenmayer D.B., Knight E., Fischer J. e A.D. Manning, 2012. Large trees are keystone structures in urban parks. Conservation Letters 5: 115-122.
- Ordonez-Barona C., Threlfall C., Baumann J., Sonkkila C., Callow D., van der Ree R., Davern M., Fuller R., Livesley S. e D. Kendal, 2018. The psycho-social effects of tree-removal from urban parks. In: World Forum on Urban Forests. Book of Abstracts (Mantova, 27 novembre-1 dicembre 2018), p. 144.
- World Health Organization, 2016. Urban green spaces and health. A review of evidence. WHO Regional Office for Europe, Copenhagen.
- Clauser F., 2018. De arborum nemorumque senectute. L'Italia forestale e montana 73 (1): 49-52.
- National Tree Safety Group, 2011. Common sense risk management of trees. Forestry Commission, Edinburgh.

Links a risorse sulla rete
- https://www.itreetools.org
- https://www.vibrantcitieslab.com/resources/forest-service-guide-to-urban-tree-canopy-assessment/
- https://www.nrs.fs.fed.us/urban/utc/
- https://www.nrs.fs.fed.us/units/urban/local-resources/downloads/nrs_inf_24_13.pdf

AMBIT	50544-Discipline della produzione
INDIVIDUAL STUDY (Hrs)	90
COURSE ACTIVITY (Hrs)	60

EDUCATIONAL OBJECTIVES OF THE MODULE

The module aims to provide students with knowledge on the management problems of urban forest and trees resources. Qualifying elements of the module are the methodologies for assessing the consistency of tree resources and the management of territorial databases for the definition of methods and procedures for the sustainable management of trees in an urban environment. Together with the use of basic tools in the field of surveying the consistency of the state of the urban forest, knowledge will be provided on methods for the evaluatin the condition of trees in order to formulate assessments regarding management interventions and planning at various scales, from the individual tree up to the urban scale. This knowledge will be used for the formulation of sustainable management techniques for both isolated trees or urban parks. A further objective of the course is to impart knowledge on the evaluation of the contribution of the urban forest and tree resources in terms of ecosystem services, both in terms of allocated biomass and sequestered carbon, contribution to the biodiversity of the urban environment and mitigation of microclimate parameters that characterize human well-being and comfort.

SYLLABUS

Hrs	Frontal teaching
6	Climate and woody plants in the urban environment and effects on physiology of woody plants
6	Methodologies for assessing the consistency of tree resources and the management of territorial databases
6	Tools for the survey of status and condition of trees in the urban forest
6	Methods and procedures for the sustainable management of trees in an urban environment
6	The urban tree infrastructure, trees and their ecosystem services. How trees modify the urban environment: isolated trees and local climate. Use of trees and hedgerows as windbreaks. Niches and microclimates in trees and effects on urban fauna and biodiversity.
3	Trees and human well-being: physical, aesthetical and psychological aspects and their evaluation
3	Trees and pollution factors; trees in polluted sites. Trees and hedgerows as buffer zones and barriers to pollutants

Hrs	Practice
24	Filed excursions. Modelling.

MODULE
AGRI-ECOLOGICAL MANAGEMENT OF HERBACEOUS PLANTS IN URBAN ENVIRONMENT

Prof.ssa TERESA TUTTOLOMONDO

SUGGESTED BIBLIOGRAPHY

Appunti delle lezioni.
Bettini V. Ecologia urbana. L'uomo e la citta. UTET, 2004.
Hruska K. Ecologia urbana. Cuen, 2000.
Fuligni P. & Rognini P. Manuale di ecologia urbana e sociale. Franco Angeli, 2005.
Gisotti G. Ambiente urbano. Introduzione all'ecologia urbana. Dario Flaccovio editore, 2007.

AMBIT	50544-Discipline della produzione
INDIVIDUAL STUDY (Hrs)	90
COURSE ACTIVITY (Hrs)	60

EDUCATIONAL OBJECTIVES OF THE MODULE

Module 1 seeks to provide the student with the skills needed to analyse the complex interaction between the urban environment and herbaceous plant species using an approach which encompasses both 'ecological' and 'sociological' features. The first part of the course will examine the main aspects of the urban ecosystem, providing an overview on climate, soil and water characteristics of the ecosystem. The second part will focus on the main herbaceous species and their characteristics, examining their production systems and their use in the urban environment (parks, streets, gardens and flowerbeds etc.). Particular attention will be given to the interaction between these plant organisms, anthropic activity and the physical environment. The course will deal with the main environmental and ecological functions provided by the use of these species in built-up areas. This will be accompanied by a brief description of some of these species used as bioindicators, in order to identify changes in the ecological conditions of urban areas regarding pollution.

SYLLABUS

Hrs	Frontal teaching
1	Introduction to the module.
5	Urban climate: status and dynamics of the atmospheric environment of the city.
4	Soils within the urban and periurban environment.
6	Urban waters: characteristics, hydrological cycle, usage of urban waste-waters.
6	Urban flora and vegetation: an ecological approach to the study of herbaceous species.
10	Criteria od adoption herbaceous species on the basis of site characteristics (walking areas, roadsides, urban meadows, bushes) and their peculiarities and ornamental usage.
5	Main cultural techniques for the management of herbaceous plants in the urban environment.
2	The recreational, functional and social role of urban green.
2	Urban pollution: definitions and classification.
2	Plant species as environmental bio-indicators.
3	Role of herbaceous species in the city: effects on man and on the environment.

Hrs	Practice
4	Recognition of most important herbaceous species adoptet in the Mediterranean environment.

Hrs	Others
10	Field trips: visits to specialized nurseries, urban parks and gardens.