



Name of the class: Urban Ecology and Landscape
Course key: 76978
Type of course: Optative
Approved credits:
Last curriculum revision date: September 2020
Pre-requisite: None

A) NAME OF THE COURSE: URBAN ECOLOGY AND LANDSCAPE

Synthetic Program				
Urban Ecology and Landscape				
General Information				
Type of curriculum proposal:	New creation	<input checked="" type="checkbox"/>	Restructuration	Adjustment
Type of class	Mandatory		Optative	<input checked="" type="checkbox"/> Complementary
Class shared with another EP or academic entity	(X) No			
	() Yes			
	¿With which PE is shared? _____			
	¿Which semester? _____			
Elaborated by:	Carlos Renato Ramos Palacios			
Reviewed by:				
Semester	Hours of theory per week	Hours of practice per week	Hours of additional work per week	Credits
	3	1	1	6
General objective	Urban ecology is a scientific discipline that studies the different relationships between living organisms and the environment in a city. Due to its applied results, the investigation of this discipline aims to develop solutions to problems related to biodiversity, natural resource management and landscape dynamics. Therefore, this course studies the theoretical and practical aspects of urban ecology, focusing on solutions at different levels and scales of			

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	study in the urban ecosystem. Through this course, students can find in this discipline an analytical framework to address general cases of ecological and environmental problems in urban systems. The course topics will be addressed, from a sustainable perspective and are related to green areas, the regeneration of urban spaces, environmental mitigation strategies and the quality of human life in the city.	
Specific objective	<ul style="list-style-type: none"> • Understand the fundamentals of urban ecology mechanisms. • Analyze the city as an induced open system. • It includes general ecological patterns and their urban system scales. • Address open spaces and green areas as nuclei of environmental renewal. • Know the urban ecological and environmental regulations. • Apply different ecological knowledge to practical examples of urban problems. 	
Specific professional competence (s) for which the class contributes.	<ul style="list-style-type: none"> • Assimilate the natural process and resources of a city in a complex system. • Use ecological and environmental variables to solve specific problems. • Detect the type of ecological process according to the urban scale. • Understand areas of urban vegetation and green areas as integrated landscape spaces. 	
Practices of the specific professional competence for which the class contributes	<ul style="list-style-type: none"> • Find practical solutions to improve urban ecological and environmental problems. • Develop arguments and decisions to increase landscape connectivity. • Apply themes and principles to ecological and urban studies. 	
Professional transversal (s) competence (s) for which the class contributes	<ul style="list-style-type: none"> • Address problems and solutions on ecological studies in urban systems. • Know different methods of ecology discipline. • Work in essays and oral communication in an interdisciplinary way. • Use scientific literature to propose environmental and ecological solutions. 	
Units	Units	Content
	1. Bases and foundations of urban ecology	Review of the issues and advances that underpin the discipline of urban ecology
	2. Ecological and landscape parameters	Understand the different ecological parameters of a city and the connectivity between vegetation fragments
	3. Case studies on urban ecology	Analysis of the different case studies on urban ecology and their applications

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Method and practice	Method	The topics to be discussed in each teaching unit will be presented in face-to-face sessions through the use of visual audio material (presentations, videos, etc.). The majority of the presentations will be exhibited by the holder of the subject and in some cases the students of the course will present works related to the corresponding subjects previous commissioned by the holder.	
	Practice		
Evaluation method	Partial Exam	25 %	Unit 1 and 2 exam
		25 %	Units 3 and 4 exam
		25%	Final essay
		25%	Research proposal for practical topic
	Final exam	The ordinary final grade will correspond to the weighted average of two two partial evaluations (25 % each) and a final essay, as well as the proposal of a practical topic (5 %): 100%	
Other activities	Teamwork		

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Bibliography and digital resources	Bibliography	<p>Bodnaruk E.W., C.N. Kroll, Y. Yang, D.J. Nowak & E.A. Endreny. (2017). Where to plant urban trees? A spatial explicit methodology to explore ecosystem service tradeoffs. <i>Landscape and Urban Planning</i>, 157: 457-467</p> <p>Borgström S.T., T. Elmqvist, P. Angelstam & C. Alfsen-Norodom (2006). Scale mismatches in management of urban landscapes. <i>Ecology and Society</i>, 11 (2): 16</p> <p>Cadenasso M.L., S. T. A. Pickett & Kirsten Schwarz. (2007). Spatial heterogeneity in urban ecosystems: Reconceptualizing land cover and a framework for classification. <i>Frontiers in Ecology and the Environment</i>, Vol. 5, No. 2, pp. 80-88</p> <p>Cecchini A. (2014). The future of the city from science to science fiction and back (and beyond). <i>City, Territory and Architecture</i>, 1:5</p> <p>Gupta K, P. Kumara, S.K. Pathanb & K.P. Sharmaa. (2012). Urban Neighborhood Green Index – A measure of green spaces in urban areas. <i>Landscape and Urban Planning</i>, 105: 325–335</p> <p>Maruani T. & I. Amit-Cohen. (2007). Open space planning models: A review of approaches and methods. <i>Landscape and Urban Planning</i>, 81: 1-13</p> <p>Nassar U. (2013). Principles of green urbanism: The absent value in Cairo, Egypt. <i>International Journal of Social Science and Humanity</i>, 3(4): 339-343</p> <p>Rebele F. (1994). Urban ecology and special features of urban ecosystems. <i>Global Ecology and Biogeography Letters</i>, 4: 173-187</p> <p>Rees W.E. (1997). Urban ecosystems: the human dimension, 1: 63-75</p> <p>Roman et al. (2018). Human and biophysical legacies shape contemporary urban forests: A literature synthesis. <i>Urban Forestry and Urban Greening</i>, 31: 157-168</p> <p>Scholz M., V.C. Uzomah & F.A.M. Al-Faraj. (2016). Potential tree species for use in urban areas in temperate and oceanic climates. <i>Heliyon</i>, Article No~e00154: 1-31</p> <p>Young R. F. (2009). Interdisciplinary foundations of urban ecology. <i>Urban Ecosystems</i>, 12:311–331</p>

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B) CONTENTS AND METHODS BY UNITS AND TOPICS

Unit 1. Bases and foundations of urban ecology		18 h
Topic 1.1 Bases and foundations of urban ecology		10 h
Subtopic	1.1.1 Theoretical aspects of urban ecology 1.1.2 The city as an open-induced system 1.1.3 The urban ecosystem (non-cyclic linear energy flow) 1.1.4 Types and morphology of cities, urban periphery	
Topic 1.2 The ecological-environmental context and the scales		8 h
Subtopic	1.2.1 Ecological patterns and environmental variables 1.2.2 Climate variations, environmental services and scales 1.2.3 Open spaces, green areas and their functions	
Bibliography and digital resources	Bibliography	<p>1.1.1 Aspectos teóricos de la ecología urbana Rees W.E. (1997). Urban ecosystems: the human dimension, 1: 63-75</p> <p>1.1.2 La ciudad como un sistema abierto-inducido Young R. F. (2009). Interdisciplinary foundations of urban ecology. Urban Ecosystems, 12:311–331</p> <p>1.1.3 El ecosistema urbano (flujo lineal energético no cíclico) Rebele F. (1994). Urban ecology and special features of urban ecosystems. Global Ecology and Biogeography Letters, 4: 173-187</p> <p>1.1.4 Tipos y morfología de ciudades, periferia urbana Cecchini A. (2014). The future of the city from science to science fiction and back (and beyond). City, Territory and Architecture, 1:5</p> <p>1.2.1 Patrones ecológicos y variables ambientales Borgström S.T., T. Elmqvist, P. Angelstam & C. Alfsen-Norodom (2006). Scale mismatches in management of urban landscapes. Ecology and Society, 11 (2): 16</p>

	Digital resources	
Teaching methods	The topics to be discussed in each teaching unit will be presented in face-to-face sessions through the use of audiovisual material (presentations, videos, etc.). The majority of the presentations will be exhibited by the teacher and in some cases the students of the course will present works related to the corresponding subjects previous commissioned by the teacher.	
Learning activities	Each student must read the specific article for the class and prepare a reading control in which, in addition to indicating key concepts and demonstrating their mastery, they must express their opinion, experiences, doubts and / or thoughts.	

Unit 2 . Ecological and landscape parameters		16 h
Topic 2.1 Ecology and attributes of the urban landscape		8 h
Subtopic	2.1.1 Environmental and spatial heterogeneity (the role of urban vegetation) 2.1.2 Distribution and quality of green areas in the urban system 2.1.3 Evaluation tools (NDVI) and proportion of green area per inhabitant	
Topic 2.2 Influence of local and social factors		8 h
Subtopic	2.2.1 Urban laws, norms and regulations of environmental / ecological type 2.2.2 Socio-ecological studies and quality of life offered by a city 2.2.3 Opportunity of the local space (biological species and environmental dimension)	
Bibliography and digital resources	Bibliography	<p>2.1.1 Environmental and spatial heterogeneity (the role of urban vegetation) Cadenasso ML, STA Pickett & Kirsten Schwarz. (2007). Spatial heterogeneity in urban ecosystems: Reconceptualizing land cover and a framework for classification. <i>Frontiers in Ecology and the Environment</i>, Vol. 5, No. 2, pp. 80-88</p> <p>2.2.1.2 Distribution and quality of green areas in the urban system Gupta K , P . Kumara, SK Pathanb & KP Sharmaa . (2012). Urban Neighborhood Green Index - A measure of green spaces in urban areas. <i>Landscape and Urban Planning</i>, 105: 325–335</p> <p>2.2.1 Urban laws, norms and regulations of environmental / ecological type Roman et al. (2018). Human and biophysical legacies shape contemporary urban forests : A literature synthesis. <i>Urban Forestry and Urban Greening</i>, 31: 157-168</p> <p>2.2.2 Socio-ecological studies and quality of life offered by a city</p>

		Nassar U. (2013). Principles of green urbanism: The absent value in Cairo, Egypt. International Journal of Social Science and Humanity, 3 (4): 339-343
	Digital resources	
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Learning activities	Each student must read the specific article for the class and prepare a reading control in which, in addition to indicating key concepts and demonstrating their mastery, they must express their opinion, experiences, doubts and / or thoughts.	

Unit 3. Case studies on urban ecology		14 h
Topic 3.1 Application and study topics		14 h
Subtopic	3.1.1 Interaction of the built environment and natural spaces 3.1.2 Planting and regeneration of plant coverings (green walls and roofs) 3.2.1 The tree as an environmental-ecological solution and as an urban problem 3.2.2 Examples of application on urban ecological studies	

Bibliography and digital resources		<p>3.1.1 Interaction of the built environment and natural spaces Maruani T. & I. Amit-Cohen. (2007). Open space planning models: A review of approaches and methods. Landscape and Urban Planning, 81: 1-13</p> <p>3.1.2 Planting and regeneration of plant coverings (green walls and roofs) Bodnaruk EW, CN Kroll, Y. Yang, DJ Nowak & EA . Endreny (2017). Where to plant urban trees? A spatial explicit methodology to explore ecosystem service tradeoffs. Landscape and Urban Planning, 157: 457-467</p> <p>3.2.1 The tree as an environmental-ecological solution and as an urban problem Scholz M., VC Uzomah & FAM Al-Faraj. (2016). Potential tree species for use in urban areas in temperate and oceanic climates. Heliyon, Article No ~ e00154: 1-31</p>
	Digital resources	
Teaching methods	The topics to be discussed in each teaching unit will be presented in face-to-face sessions through the use of audiovisual material (presentations, videos, etc.). The majority of the presentations will be exhibited by the teacher and in some cases the students of the course will present works related to the corresponding subjects previous commissioned by the teacher.	
Learning activities	Each student must read the specific article for the class and prepare a reading control in which, in addition to indicating key concepts and demonstrating their mastery, they must express their opinion, experiences, doubts and / or thoughts.	

C) TEACHING AND LEARNING STRATEGIES

The topics to be discussed in each teaching unit will be presented in face-to-face sessions through the use of audiovisual material (presentations, videos, etc.). The majority of the presentations will be exhibited by the holder of the subject and in some cases the students of the course will present works related to the corresponding subjects previous commissioned by the holder.

Each student must read the specific article for the class and prepare a reading control in which, in addition to indicating key concepts and demonstrating their mastery, they must express their opinion, experiences, doubts and / or thoughts.

D) EVALUATION AND ACCREDITATION

Preparation and / or presentation of:	Periodicity	Covers	Weighting of each partial in relation to the ordinary
First partial exam	At the end of Unit 2	Units 1 to 2	25%
Second partial exam:	At the end of Unit 4	Units 3 to 4	25%
Final essay	At the end of Unit 4		25%
Practical exercise (Case study) Final presentation of results	-	-	25 %
TOTAL			100 %
Ordinary exam	The ordinary final grade will consist of the 3 partial grades (80%) and the field practice report rating (20%).		
Other academic activities required	Special non-mandatory activities will not have a value in the partial evaluation. This consists of attending special events on the subject or participation as organizers in events of the discipline, whether from the Faculty or outside it as dissemination and training activities		

E) BIBLIOGRAPHY AND DIGITAL RESOURCES

Basic Texts

- Bodnaruk EW, CN Kroll, Y. Yang, DJ Nowak & EA Endreny. (2017). Where to plant urban trees? A spatial explicit methodology to explore ecosystem service tradeoffs. *Landscape and Urban Planning*, 157: 457-467
- Borgström ST, T. Elmqvist, P. Angelstam & C. Alfsen-Norodom (2006). Scale mismatches in management of urban landscapes. *Ecology and Society*, 11 (2): 16
- Cadenasso ML, STA Pickett & Kirsten Schwarz. (2007). Spatial heterogeneity in urban ecosystems: Reconceptualizing land cover and a framework for classification. *Frontiers in Ecology and the Environment*, Vol. 5, No. 2, pp. 80-88
- Cecchini A. (2014). The future of the city from science to science fiction and back (and beyond). *City, Territory and Architecture*, 1: 5
- Gupta K, P. Kumara, SK Pathanb & KP Sharmaa. (2012). Urban Neighborhood Green Index - A measure of green spaces in urban areas. *Landscape and Urban Planning*, 105: 325–335
- Maruani T. & I. Amit-Cohen. (2007). Open space planning models: A review of approaches and methods. *Landscape and Urban Planning*, 81: 1-13

Nassar U. (2013). Principles of green urbanism: The absent value in CairO, Egypt. *International Journal of Social Science and Humanity*, 3 (4): 339-343

Rebele F. (1994). Urban ecology and special features of urban ecosystems. *Global Ecology and Biogeography Letters*, 4: 173-187

Rees WE (1997). Urban ecosystems: the human dimension, 1: 63-75

Roman et al. (2018). Human and biophysical legacies shape contemporary urban forests: A literature synthesis. *Urban Forestry and Urban Greening*, 31: 157-168

Scholz M., VC Uzomah & FAM Al-Faraj. (2016). Potential tree species for use in urban areas in temperate and oceanic climates. *Heliyon*, Article No ~ e00154: 1-31

Young RF (2009). Interdisciplinary foundations of urban ecology. *Urban Ecosystems*, 12: 311–331

Supplementary Texts

Alberti M. (2008). *Advances in Urban Ecology Integrating Humans and Ecological Process in Urban Ecosystems*. Springer New York, USA 379 p.

Gill SE, JF Handley, AR Ennos & S. Pauleit. (2007). Adapting cities for climate change: The role of the green infrastructure. *Built Environment*, 30 (1): 115-133

Pickett STA, ML Cadenasso, JM Grove, CG Boone, PM Groffman, E. Irwin, SS Kaushal, V. Marshall, BP McGrath, CH Nilon, RV Pouyat, K. Szlavecz, A. Troy, P. Warren. (2011). Urban ecological systems: Scientific foundations and a decade of progress. *Journal of Environmental Management*, 92: 331-362

Roggema R. (2016). The future of sustainable urbanism: A redefinition. *City, Territory and Architecture*, 3:22