



CURRICULAR

Código:	201340000		Gramáticas De Forma-3c		Tipo de Unidade Curricular	Optativa	
Ano Lectivo	2013-2014		Curso:	Vários	Ciclo Estudos:	1º <input type="checkbox"/> 2º <input type="checkbox"/> 3º <input checked="" type="checkbox"/>	
Créditos:	5,0 ECTS		Idioma leccionado	<input checked="" type="checkbox"/> Português <input checked="" type="checkbox"/> Inglês <input type="checkbox"/> Outro idioma	Ano Curricular:	1º <input checked="" type="checkbox"/> 2º <input type="checkbox"/> 3º <input type="checkbox"/> 4º <input type="checkbox"/> 5º <input type="checkbox"/>	
Área Científica:	<input checked="" type="checkbox"/> Arq. ^a <input checked="" type="checkbox"/> Urb. ^o <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> DCV <input type="checkbox"/> CST <input type="checkbox"/> TAUD <input type="checkbox"/> HTAUD				Annual:	Semestral:	
Pré-requisitos:	Sim <input type="checkbox"/> Não <input checked="" type="checkbox"/> Não existem pré-requisitos para esta unidade curricular				Trimestral:	1º <input type="checkbox"/> 2º <input type="checkbox"/> 3º <input type="checkbox"/>	

Docente(s) Responsável(eis) pela U.C.

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José P. Duarte		
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Docente(s) da U.C.

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Categoria:	Email:	URL:
Categoria:	Email:	URL:

Horas de Contacto:

Teóricas:	Práticas:	Teórico-Práticas:	Laboratoriais:	Seminários:	Tutoriais:	Outras:	Total Horas de Contacto:
0,0 H	0,0 H	21,0 H	0,0 H	0,0 H	0,0 H	0,0 H	21,0 Horas

Estimativa de Horas Totais de Trabalho:

Inclui o total de horas de contacto mais as horas extra dedicadas à unidade curricular.	Horas Totais de Trabalho: 140,0 Horas
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Objectivos (tópicos) limite 900 caracteres

Esta disciplina tem como objetivos concretos:

- (1) Introduzir um processo de apoio à conceção usando um processo computacional, ou generativo, nas suas componentes teóricas e práticas;
- (2) Introduzir o paradigma de um processo computacional que se caracteriza por ser o primeiro a introduzir uma dimensão visual e que atualmente continua a ser o único a fazê-lo;
- (3) Fornecer meios estruturados de análise e de síntese quer para compreender linguagens de projeto existentes quer explorar novas linguagens.

Conteúdos Programáticos / Programa limite 1500 caracteres

(1) Introdução às gramáticas da forma: teoria e aplicações em arquitetura, urbanismo e design;



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- (2) As gramáticas de forma no ensino;
- (3) Forma, forma analítica, computação da forma, transformações no espaço Euclidiano, álgebras;
- (4) Relação espacial, regra, rótulos, derivação, recursão, parametrização;
- (5) Gramáticas de cor e de pesos;
- (6) Gramáticas compostas;
- (7) Gramáticas descritivas;
- (8) Aplicações em arquitetura, urbanismo e design;
- (9) Críticas à teoria, analogias com as gramáticas de Chomsky e à máquina de Turing;
- (10) Transformações estilísticas;
- (11) Interpretadores de gramáticas 2D;
- (11) Interpretadores de gramáticas 3D.

As aulas serão suportadas por leituras de artigos que desenvolvem particularmente cada tema e pela realização de pequenos trabalhos práticos.

Competências a adquirir pelo discente (tópicos) limite 3000 caracteres

Fornecer ao aluno instrumentos teóricos e práticos que lhe permita a compreensão e a descrição da forma de acordo com os princípios generativos das gramáticas, os quais poderão ser traduzidos posteriormente para uma linguagem de programação. Entende-se por gramáticas da forma um sistema lógico e visual que permite descrever a forma nas suas diferentes significações.

Bibliografia Principal limite 3000 caracteres

- Stiny, G. Shape: talking about seeing and doing. Cambridge, Mass.: MIT Press, 2006.

Bibliografia Complementar limite 3000 caracteres

- Chau, H. H. (2004) Evaluation of a 3D Shape Grammar Implementation. Design Computation and Cognition '04, JS Gero (Ed.), pp.357-376.
- Chomsky N. (1957) Syntactic Structures. The Hague: Mouton. Reprint. Berlin and New York (1985).
- Duarte, J. P. (2005) A Discursive Grammar for Customizing Mass Housing: the case of Siza's houses at Malagueira. Automation in Construction, 14(2), pp.265-275, Elsevier Science.
- Fleisher, A. (1992) Grammatical architecture?. Environment and Planning B: Planning and Design, 19, pp.221-226.
- Koning, H., and Eisenberg, J. (1981) The language of the prairie: Frank Lloyd Wright's prairie houses. Environment and Planning B: Planning and Design, 8, pp.295-323.
- Li, Andrew I-kang (2001) Teaching style grammatically, with an example from traditional Chinese architecture. In The proceedings of Mathematics & design 2001: the third international conference (3-5 July 2001, Geelong, Australia), pp.270-277.
- Knight, T. W. (1989) Shape Grammars in Education and Practice: History and Prospects. Internet Paper. <http://www.mit.edu/~tknight/IJDC/>
- Knight, T. W. (1989) Color grammars: designing with lines and colors. Environment and Planning B: Planning and Design, 16, pp.417-449.
- Knight, T. W. (1989) Transformations of De Stijl art: the paintings of Georges Vantongerloo and Fritz Glarner. Environment and Planning B: Planning and Design, 16, pp.51-98.
- Knight, T. W. (1993) Color Grammars: the Representation of Form and Color in Design. Leonardo, 26, pp.117-124.
- Stiny G., and Gips J. (1972) Shape Grammars and the Generative Specification of Painting and Sculpture. C V Freiman (ed) Information Processing 71 (Amsterdam: North-Holland) 1460-1465. Republished in Petrocelli O R (ed) 1972 The Best Computer Papers of 1971: Auerbach, Philadelphia pp.125-135.
- Stiny, G. (1976) Two exercises in formal composition. Environment and Planning B: Planning and Design, 3(2), pp.187-210.
- Stiny, G. and Mitchell, W. J. (1978) The Palladian grammar. Environment and Planning B: Planning and Design, 5, pp.5-18.
- Stiny, G. and Mitchell, W. J. (1980) The grammar of paradise: on the generation of Mughul gardens, Environment and Planning B: Planning and Design, 7, pp.209-226.



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- Stiny, G. (1980) Kindergarten grammars: designing with Froebel's building gifts. Environment and Planning B: Planning and Design, 3, pp.461.
- Stiny, G. (1980) Introduction to shape and shape grammars. Environment and Planning B: Planning and Design, 7(3), pp.343-351.
- Stiny, G. (1990) What is a design?. Environment and Planning B: Planning and Design, 17, pp.97-103.
- Stiny, G. (1992) Weights. Environment and Planning B: Planning and Design, 19, pp.413-430.
- Turing, A. (1936) On Computable Numbers, With an Application to the Entscheidungsproblem, Proceedings of the London Mathematical Society, 42 (2).

Avaliação (elementos e critérios) limite 900 caracteres

1. Leituras (50% da nota final): O primeiro trabalho é uma coletânea de mini textos (1/2 a 1 página) com o comentário crítico a cada uma dos temas/textos que vão sendo lidos semanalmente.
2. Trabalho final (50% da nota final): a escolher pelo aluno com o acordo do docente, entre as três alternativas seguintes:
 - 2.1 Ensaio teórico sobre um tema particular do universo das gramáticas da forma;
 - 2.2. Esboço de uma gramática analítica ou sintética;
 - 2.3. Implementação informática de uma gramática já desenvolvida pelo aluno ou por outro investigador.

Data de actualização

Última actualização em: quinta-feira, 1 de Agosto de 2013



UNIT FORM

Code:		Curricular Unit Type	
201340000 Shape Grammars		Elective	
Academic Year	Degree:	Cycle of Studies:	
2013-2014	Select a Degree	1º <input type="checkbox"/> 2º <input type="checkbox"/> 3º <input checked="" type="checkbox"/>	
Unit Credits:	Lecture Language	Curricular Year:	
5,0 ECTS	<input checked="" type="checkbox"/> Portuguese <input checked="" type="checkbox"/> English <input type="checkbox"/> Specify Other language	1º <input checked="" type="checkbox"/> 2º <input type="checkbox"/> 3º <input type="checkbox"/> 4º <input type="checkbox"/> 5º <input type="checkbox"/>	
Scientific Area:		Annual:	Semester:
<input checked="" type="checkbox"/> Archit. <input checked="" type="checkbox"/> Urban. <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> DCV <input type="checkbox"/> CST <input type="checkbox"/> TAUD <input type="checkbox"/> HTAUD		<input type="checkbox"/>	1º <input checked="" type="checkbox"/> 2º <input type="checkbox"/>
Prerequisites:			Trimester:
Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	There are no prerequisites for this curricular unit		1º <input type="checkbox"/> 2º <input type="checkbox"/> 3º <input type="checkbox"/>

Responsible Professor(s)

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José P. Duarte		
Full Professor	Email: jduarte@fa.utl.pt	URL: www.fa.utl.pt

Lecture(s)

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Rank:	Email:	URL:
Rank:	Email:	URL:

Contact Hours:

Lectures:	Practical:	Lectures-Practical:	Laboratory:	Seminary:	Tutorials:	Others:	Total Contact Hours:
0,0 H	0,0 H	21,0 H	0,0 H	0,0H	0,0 H	0,0 H	21,0 Hours

Estimated Workload

Includes the total contact hours plus overtime devoted to the course unit

Total Workload: 140,0 Hours

Goals (topics) limit 900 characters

this course aims to:

- (1) Introduce a process to support design using a generative computational process in their theoretical and practical components;
- (2) Introduce the paradigm of a computational process that takes into account visual aspects and which currently continues to be the only one to do so comprehensively;
- (3) Provide a structured means to analyze and synthesize shape both for understanding existing design languages and for exploring new ones.

Programmatic contents / Programme limit 1500 characters

(1) Introduction to shape grammar: theory and applications in architecture, urbanism and design.



UNIT FORM

- (2) Shape grammars in education;
 - (3) Form, shape analysis, shape computation, transformations in Euclidean space, algebras;
 - (4) Spatial relations, rules, labels, derivation, recursion, parameterization;
 - (5) Color and weight grammars;
 - (6) Compound grammars;
 - (7) Descriptive grammars;
 - (8) Applications in architecture, urbanism and design;
 - (9) Critics of the theory, analogies with Chomsky grammars and Turing machines;
 - (10) Stylistic transformations;
 - (11) 2D grammars interpreters;
 - (11) 3D grammars interpreters.
- Classes will be supported by a series of readings and the development of small practical exercises on selected themes.

Competencies to be acquired by students (topics) limit 3000 characters

Provide students with theoretical and practical tools that allow the understanding and description of shape according to the generative principles of grammars, which can later be translated into a programming language. It is understood by shape grammars a logical system for describing visual form in its different meanings.

Main Bibliography limit 3000 characters

- Stiny, G. Shape: talking about seeing and doing. Cambridge, Mass.: MIT Press, 2006.

Additional Bibliography limit 3000 characters

- Chau, H. H. (2004) Evaluation of a 3D Shape Grammar Implementation. Design Computation and Cognition '04, JS Gero (Ed.), pp.357-376.
- Chomsky N. (1957) Syntactic Structures. The Hague: Mouton. Reprint. Berlin and New York (1985).
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- Stiny, G. (1990) What is a design?. Environment and Planning B: Planning and Design, 17, pp.97-103.
- Stiny, G. (1992) Weights. Environment and Planning B: Planning and Design, 19, pp.413-430.
- Turing, A. (1936) On Computable Numbers, With an Application to the Entscheidungsproblem, Proceedings of the London Mathematical Society, 42 (2).

Assessment limit 900 characters

1. Readings (50% of final grade): The first work is a collection of mini texts (1/2 to 1 page) with a critical commentary on each of the texts read weekly.
2. Final work (50% of final grade): to choose by the student with the agreement of the teacher, between the following three alternatives:
 - 2.1 Theoretical essay on a particular theme from the universe of shape grammars;
 - 2.2 Sketch of an analytic or synthetic grammar;
 - 2.3. Computer implementation of a grammar developed by the student or other researcher.

Last updated

Last updated on: Thursday, 1 August 2013