

Código: 001340000	<b>Gramáticas De Forma</b>	Tipo de Unidade Curricular Optativa
Ano Lectivo 2015-2016	Curso: Vários CDA, CEA-CAAUD	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. <sup>a</sup> <input checked="" type="checkbox"/> Urb. <sup>o</sup> <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> DCV <input type="checkbox"/> CST <input type="checkbox"/> TAUD <input type="checkbox"/> HTAUD		Anual: <input type="checkbox"/>
Pré-requisitos: Sim <input type="checkbox"/> Não <input checked="" type="checkbox"/> Não existem pré-requisitos para esta unidade curricular		Semestral: 1º <input checked="" type="checkbox"/> 2º <input type="checkbox"/>
		Trimestral: 1º <input type="checkbox"/> 2º <input type="checkbox"/> 3º <input type="checkbox"/>

Docente(s) Responsável(eis) pela U.C.

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Docente(s) da U.C.

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Categoria:	Email:	URL:
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

<p>Esta disciplina tem como objetivos concretos:</p> <p>(1) Introduzir um processo de apoio à conceção usando um processo computacional, ou generativo, nas suas componentes teóricas e práticas;</p> <p>(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;</p> <p>(3) Fornecer meios estruturados de análise e de síntese quer para compreender linguagens de projeto existentes quer explorar novas linguagens.</p>
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Conteúdos Programáticos / Programa limite 1500 caracteres

<p>(1) Introdução às gramáticas da forma: teoria e aplicações em arquitetura, urbanismo e design;</p> <p>(2) As gramáticas de forma no ensino;</p> <p>(3) Forma, forma analítica, computação da forma, transformações no espaço Euclidiano, álgebras;</p> <p>(4) Relação espacial, regra, rótulos, derivação, recursão, parametrização;</p> <p>(5) Gramáticas de cor e de pesos;</p> <p>(6) Gramáticas compostas;</p> <p>(7) Gramáticas descritivas;</p> <p>(8) Aplicações em arquitetura, urbanismo e design;</p> <p>(9) Críticas à teoria, analogias com as gramáticas de Chomsky e à máquina de Turing;</p> <p>(10) Transformações estilísticas;</p> <p>(11) Interpretadores de gramáticas 2D;</p> <p>(11) Interpretadores de gramáticas 3D.</p> <p>As aulas serão suportadas por leituras de artigos que desenvolvem particularmente cada tema e pela realização de pequenos trabalhos práticos.</p>
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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) 14,60-14,65. 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.
- 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 Duas Alternativas Seguintes:
  - 2.1 Ensaio Teórico Sobre Um Tema Particular Do Universo Das Gramáticas Da Forma;
  - 2.2. Esboço Ou Implementação Informática De Uma Gramática Analítica Ou Sintética;

**Data de actualização**

Última actualização em: terça-feira, 21 de junho de 2016

Code: 001340000	Shape Grammars	Curricular Unit Type Elective
Academic Year 2015-2016	Degree: Select a Degree CDA, CEA-CAAUD	Cycle of Studies: 1° <input type="checkbox"/> 2° <input type="checkbox"/> 3° <input checked="" type="checkbox"/>
Unit Credits: 5,0 ECTS	Lecture Language <input checked="" type="checkbox"/> Portuguese <input checked="" type="checkbox"/> English <input type="checkbox"/> Specify Other language	Curricular Year: 1° <input checked="" type="checkbox"/> 2° <input type="checkbox"/> 3° <input type="checkbox"/> 4° <input type="checkbox"/> 5° <input type="checkbox"/>
Scientific Area: <input checked="" type="checkbox"/> Archit. <input checked="" type="checkbox"/> Urban. PI <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> DCV <input type="checkbox"/> CST <input type="checkbox"/> TAUD <input type="checkbox"/> HTAUD		Annual: <input type="checkbox"/>
Prerequisites: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> There are no prerequisites for this curricular unit		Semester: 1° <input checked="" type="checkbox"/> 2° <input type="checkbox"/>
		Trimester: 1° <input type="checkbox"/> 2° <input type="checkbox"/> 3° <input type="checkbox"/>

Responsible Professor(s)

Luís Romão Assistant Professor Email: lromao@fa.ulisboa.pt URL: www.fa.ulisboa.pt/~lromao
José P. Duarte Full Professor Email: jduarte@fa.ulisboa.pt URL: www.fa.ulisboa.pt/~jduarte

Lecture(s)

Luís Romão Assistant Professor Email: lromao@fa.ulisboa.pt URL: www.fa.ulisboa.pt/~lromao
Rank: Email: URL:
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

<p>this course aims to:</p> <ol style="list-style-type: none"> <li>(1) Introduce a process to support design using a generative computational process in their theoretical and practical components;</li> <li>(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;</li> <li>(3) Provide a structured means to analyze and synthesize shape both for understanding existing design languages and for exploring new ones.</li> </ol>
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Programmatic contents / Programme limit 1500 characters

<ol style="list-style-type: none"> <li>(1) Introduction to shape grammars: theory and applications in architecture, urbanism and design;</li> <li>(2) Shape grammars in education;</li> <li>(3) Form, shape analysis, shape computation, transformations in Euclidean space, algebras;</li> <li>(4) Spatial relations, rules, labels, derivation, recursion, parameterization;</li> <li>(5) Color and weight grammars;</li> <li>(6) Compound grammars;</li> <li>(7) Descriptive grammars;</li> <li>(8) Applications in architecture, urbanism and design;</li> <li>(9) Critics of the theory, analogies with Chomsky grammars and Turing machines;</li> <li>(10) Stylistic transformations;</li> <li>(11) 2D grammars interpreters;</li> <li>(11) 3D grammars interpreters.</li> </ol> <p>Classes will be supported by a series of readings and the development of small practical exercises on selected themes.</p>
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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
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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).
- 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.
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- 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.
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- 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.
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- 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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- 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 Two Alternatives:
  - 2.1 Theoretical Essay On A Particular Theme From The Universe Of Shape Grammars;
  - 2.2. Sketch Or A Computer Implementation Of An Analytic Or Synthetic Grammar.

Last updated

Last updated on: Tuesday, 21 June 2016