UNIVERSIDADE FEDERAL DE SANTA CATARINA

CENTRO DE COMUNICAÇÃO E EXPRESSÃO
DEPARTAMENTO DE EXPRESSÃO GRÁFICA
CURSO DE DESIGN

CAMPUS UNIVERSITÁRIO TRINDADE
CAIXA POSTAL 476
CEP. 88040-900 – FLORIANÓPOLIS – SANTA CATARINA

COURSE SYLLABUS - 2019.2

1. IDENTIFICATION

Course:	**Smart Design and Digital Prototyping**
Code:	EGR5742 - Tópicos especiais em Design de Produto II
Class time:	Wednesdays (1:30PM – 5:50PM)
Hours/week:	04 TOTAL: 72Hours
Place:	PRONTO3D
Prerequisite:	-
Attended courses:	Architecture / Product Design / Engineering / Automation
Professors:	Carlos Eduardo Verzola Vaz / Regiane Trevisan Pupo
Language:	The class will be taught in English in case a foreign student is present.

2. SYNOPSIS

Introduction to automaton concepts in design projects. Digital prototyping application. Dynamic models development (digital simulation). Introduction to parametric modelling. Prototyping automation. Digital fabrication experimentation.

3. OBJETIVES

General

- The general objective is to define and contextualize contemporary processes in conception and materialization within design project, besides stimulating research, study and analysis of technological alternatives from new production paradigms.

Specifics

- To enable students to develop ideas from the knowledge of parametric modelling;
- To practice creativity from the exploration on the use of computational tools. Exercitar a criatividade a partir da exploração e uso do ferramental computacional;
- To explore automation basic concepts. Explorar conceitos básicos de automação;
- To introduce and practice different techniques and methods about prototyping and digital fabrication.

4. METHODOLOGY

PBL – Problem Based Learning

Problem-based learning is a pedagogical strategy for posing significant, contextualized, real world situations, and providing resources, guidance, and instruction to learners as they develop content knowledge and problem-solving skills (Mayo, Donnelly, Nash, & Schwartz, 1993). In problem-based learning, students collaborate to study the issues of a problem as they strive to create viable solutions. Unlike traditional instruction, which is often conducted in lecture format, teaching in problem-based learning normally occurs within small discussion groups of students facilitated by a faculty tutor (Aspy, Aspy, & Quimby, 1993, Bridges & Hallinger, 1991).

Because the amount of direct instruction is reduced in problem-based learning, students assume greater responsibility for their own learning (Bridges & Hallinger, 1991). The instructor's role becomes one of subject

matter expert, resource guide, and task group consultant. This arrangement promotes group processing of information rather than an imparting of information by faculty (Vernon & Blake, 1993). The instructor's role is to encourage student participation, provide appropriate information to keep students on track, avoid negative feedback, and assume the role of fellow learner (Aspy et al., 1993).

5. CONTEÚDO PROGRAMÁTICO

- Contextualization of computation applied to design process and new modes of design production;
- Introduction to parametric modeling environments and automation concepts, defining basic concepts of programming and form generation;
- Explore different computational concepts in a creative way, generating unusual or unexpected design solutions;
- Learn and explore the different digital manufacturing methods (additive, subtractive and formative) as a way to materialize an idea or project solution.
- Production of a prototype in digital manufacturing equipment.

6. EVALUATION

The classwork will be developed in groups and evaluation is described below:

1. 5ª. week – first prototype (20%)
2. 10ª. week – second prototype (20%)
3. 18ª. week – last prototype (60%)

7. REFERENCES

ASPY, D.N., ASPY, C. B., & QUIMBY, P.M. (1993). **What doctors can teach teachers about problem-based learning**. Educational Leadership, 50(7), 22-24.

BRIDGES, E. M., & HALLINGER, P. (1991, September). **Problem-based learning in medical and managerial education**. Paper presented for the Cognition and School Leadership Conference of the National Center for Educational Leadership and the Ontario Institute for Studies in Education, Nashville, TN.

DUNN, Nick**. Digital Fabrication in Architecture**. Londres: Laurende King Publishing, 2012. ISBN: 978 185669 891 7.

MAYO, P., DONNELLY, M. B., NASH, P. P., & SCHWARTZ, R. W. (1993). **Student Perceptions of Tutor Effectiveness in problem-based surgery clerkship**. Teaching and Learning in Medicine. 5(4), 227-233.

PAYNE, Andrew, ISSA, Raja (2009). **The Grasshopper Primer - 2nd Edition.** Robert McNeel & Associates. Disponível em: < http://www.grasshopper3d.com/page/tutorials-1> Acesso em: fevereiro de 2016.

PUPO, Regiane Trevisan. **A inserção da PROTOTIPAGEM E FABRICAÇÃO DIGITAIS no processo de projeto: um novo desafio para o ensino de arquitetura**. Campinas, 2008. 237f. Tese (Doutorado em Engenharia Civil) – Faculdade de Engenharia Civil, Arquitetura e Urbanismo, Universidade Estadual de Campinas. Disponível em: < http://www.bibliotecadigital.unicamp.br/> Acesso em: fevereiro de 2016.

SCHODEK, D. et al. **Digital Design and Manufacturing**. New Jersey: John Wiley and sons, 2005.

THE social life of small urban Spaces (1988). Direction: William Hollingsworth Whyte, Washington, Direct Cinema Limited.

THOMPSON, Rob. **The manufacturing guides prototyping and low-volume production**. ISBN: 978-0-500-28918-1. Thames & Hudson. 2011