

Minor Coordinator	<a href="#">Prof. Dr. Ir. Sevil Sariyildiz</a>
Responsible Instructor	<a href="#">Dr.ir. P. Nourian</a>
Instructors (-Initials)	<a href="#">Dr. Ir. P. Nourian</a> (TU Delft, Design Informatics- PZN) <a href="#">Ir. Hans Hoogenboom</a> (TU Delft, Design Informatics - HHG) <a href="#">Ir. Shervin Azadi</a> (TU Delft, Design Informatics - SAZ)

### Introduction

Spatial Computing (BK-MI-197, 15 ECTS) is offered as a minor degree programme at TU Delft consisting of a computational design studio (BK7083, 9 ECTS) and a computational simulations course (BK7084 6 ECTS). The goal of this studio (BK7083) is to introduce a participatory generative approach to architectural design. In doing so, the course also introduces basic mathematical and computational skills, especially in geometry, topology and graph theory (spatial mathematics), which are necessary for systematic analysis, synthesis, simulation, decision-making, and optimization in architectural design. We propose generative design as a feed-forward way of designing in which the form is systematically derived from functional requirements. The goal of this studio is not to make a building in a 'parametric style', but to learn how to develop computational design workflows. Therefore, the focal points of attention in the course are gamification, programming, and mathematics for participatory generative design. Therefore, the main deliverable will be a demonstration of a functioning workflow showing the transformation of a site, a program of requirements, key performance indicators, and the preferences of the prospective inhabitants into a building.

### Theme

The theme of the year is redefining design as a game, with rules and scores. We define a rulebook, specify the moves in the game; devise automatic scoring mechanisms; and let designers or prospective inhabitants play the design game almost as LEGO, Minecraft, and Sims☺.



### Learning goals

Table 1: Learning Objectives

<a href="#">BK-7084</a>	"The students will receive a good overview of physically-based light simulation, transformations, and procedural content generation. They will learn how to code simple prototypes themselves to verify their knowledge."
<a href="#">BK-7083</a>	"Having followed this course, the student is expected to be able to set up a systematic computational design process for meeting the design requirements and achieving high-performance."
<a href="#">BK-MI-197</a>	having followed the minor program, the students will be expected to have learnt:  to systematically design and underpin the decisions made for designing a complex building project; specifically, by the end of the course, the students are expected to be able: <ul style="list-style-type: none"><li>• to formulate a program of requirements based on the needs of a client;</li><li>• to use basic spatial mathematical constructs in architectural design and simulation;</li><li>• to perform spatial data visualization using existing software tools or programming;</li><li>• to distinguish and identify data modelling, analysis, simulation, evaluation and optimization methods;</li><li>• to utilize simulation in architectural design;</li><li>• to show by analytic models or simulations how a design is supposed to work;</li><li>• to compare design or decision alternatives according to evaluation criteria; and,</li><li>• to formulate design problems and draft algorithms for procedural design.</li></ul>