Geodesign in Education: Introducing Geodesign in the Bachelor of AUBS at TU Delft

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Location

Hoboken, Rotterdam
Why GIS

**Gap** between Design and GIS – GIS lacking in (base) education of Architecture & Urbanism

GIS, Geodata and informatics are **essential** in tools delivering evidence-based, data-driven and parametric design.
BSc AUBS

Architecture, Urbanism & Building Sciences

“In this degree programme you will be combining technology, theory and design, and your own creativity and spatial insight play a major role in this. Your education will be technical and scientific and you will learn how to analyse complex issues in a clear and structured way. You will work on a range of different design projects, either individually or in groups, and will learn about the way technology, culture and the living environment interact with each other”
Programma BSc AUBS

3 years, 6 semesters, 12 quarters

5 design projects

1. Home & Landscape
2. Design & Engineering
3. City & Public Space
4. Housing & (Living) Environment
5. Urban Planning & Strategy
BK3ON3 : City & Public Space

ON3 = design project quarter
2\textsuperscript{nd} year, 1\textsuperscript{st} \underline{urban} design project

10 weeks

Urban project (plan area ±1x1km)
Design through the scales (region/city/area)
4 tracks

1. Urban Morphology / Urban Fabrics (Dijkstra)
2. Sustainability / Environmental Technology (Van Timmeren)
3. Heritage / Cultural History (Meurs)
4. GeoDesign – evidence-based / data-driven / parametric design (Van der Spek)
Methodology

Traditional:
- mapping (hand, sketch, illustrator);
- designing (hand/cad);
- visualisation;
- reflection on final result

Geodesign:
- data- and evidence based (digital, GIS);
- 3D visualisation IN process
- direct feedback using tools (models)
Setup (original) : ArcGIS

Originally: GIS (ArcGIS Pro/Online)

Week 1-6 analysis (GIS)
Week 7-8 alternatives
Week 9-10 design (elaboration)

Problem: entrance level/prior knowledge:
NO GIS, GIS training required…. GIS is not design-oriented, mostly 2D
Available/applicable datasets for design location
Setup (new)

3D, user-oriented, model-based
Continue with Grasshopper, Rhino
Use of interactive (3D) tools.
USE of data + 3D in design process
Setup: 10 weeks

6 weeks: design-oriented analysis
– 1 aspect / tool -> design

2 weeks: design-research (variants)
- combination of aspects/tools

2 weeks: synthesis = concept design
(elaboration, visualisation, detailing)
Analysis -> Design -> Test

Data -> real-time, useful data for design
3D -> 3D VR + AR (3D virtual model)
Informatics (tools)

Outcomes: models = values, direct feed-back

Virtual Room (VR)
Presentation on site with AR
Tools

Sun/shadow, Energy
Temperature / Urban Heat Island
Wind/ Noise / Air quality

Centrality / Gravity / Space Syntax
Reach / Directness / Straightness (network)

Programme / Use / Density
Public / Open Space
Traffic / Flows
City from Eye-level: Isovist (2D/3D)
Experience

Data
accessibility / availability = limited
either on building level or city level

Tools
require valid models (issue)
+ Data + maps (should be light)
Sponsor Logos

- Geodan
- VU University Amsterdam
- TU Delft Delft University of Technology
- Esri