

Generative Design in Architecture

Object-Oriented Research using IoT, BIM/GIS, and Light AI

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Generative Design is not magic...

It's about **making design decisions with evidence**,
using data, simulations, and clear thresholds.

This course turns “generative” into a method, not a slogan.

Why this course?

- Architecture is increasingly shaped by data, sensors, and AI.
- Students need to make **design decisions with evidence**, not intuition alone.
- This elective offers a structured, reproducible, and practice-facing pathway.

Who is this for?

- **Master of Architecture** (primary audience)
- **RPg / PhD students** (3 pending enrollment)
- **Undergraduates** (3 (BAAS, BASc and exchange student as it stands)

Two parallel tracks:

- **No/Low-Code Track** – default, spreadsheet/preset based
- **Code-Heavy Track** – optional, Python/GH/Colab allowed

Pedagogical Emphasis

- Focus on **clarity over complexity**.
- Grading emphasizes:
 - Method–question fit
 - Handling uncertainty
 - Decision usefulness
- Avoids “black-box” AI tricks—simple, transparent tools preferred.

Key Learning Outcomes

Students will learn to:

- ① Frame clear decision questions linked to studio work.
- ② Select right-sized tests (proxy or preset simulation).
- ③ Show uncertainty with ranges and sensitivity checks.
- ④ Communicate for both practice (2-slide memo) and research (short report).
- ⑤ Deliver reproducible work (Reproducibility Capsule).



Figure: Checkout this site if u could!

Course at a Glance

- 12 weeks \times 2 hours
- Weekly progression: from defining objects \rightarrow testing \rightarrow communicating
- Mix of seminars, peer reviews, clinics, and a final “Object Fair”

Student Workflow (Two Tracks)

Low-/No-Code Track (default)

- 1 Pick object + decision claim
- 2 Evidence map (tables, preset sources)
- 3 Proxy test OR preset simulation (sliders, GUIs)
- 4 Visualize in spreadsheets
- 5 Threshold + memo/report
- 6 Capsule: spreadsheet + figures

Code-Heavy Track (optional)

- 1 Same object + claim framing
- 2 Evidence map (can integrate APIs/scripts)
- 3 Write/test short Python/GH/Colab workflows
- 4 Visualization via notebooks or GH scripts
- 5 Threshold + memo/report
- 6 Capsule: notebook + data dictionary

Both tracks → equivalent deliverables, different technical depth.

Assessment Overview

- Decision Claim (10%)
- Evidence Map (10%)
- Test Plan & Pilot Note (10%)
- Final Decision Package (40%)
- Peer Reviews + Change Logs (15%)
- Mentor Dialogue (10%)
- Attendance + Methods Passport (5%)

Each major task has two submission modes:

- Low-code (default): reproducible spreadsheets, preset sims
- Code-heavy (optional): scripts/notebooks with clear docs

Signature Deliverables

- **Practice Case:** 2-slide decision memo (firm-facing)
- **Research Brief:** 2-page short report
- **Object Card:** key figure
- **Reproducibility Capsule:** bundle (spreadsheet OR notebook + figure sources)

Both tracks produce **equivalent outputs**, but with different technical depth.

Key Policies

- Testability rule – proxy test or preset simulation if real data is inaccessible.
- Evidence tiers – honesty about strength of evidence.
- Decision thresholds – end with a clear numeric adopt/defer rule.
- Data ethics & privacy – HKU guidelines strictly applied.

Takeaways

- This is a methods-first course for **design evidence**.
- Scales across MArch, PhD, and even undergrad backgrounds.
- Students leave with **reproducible, practice-ready outputs**.

Questions?