

DES 212: Design Media II

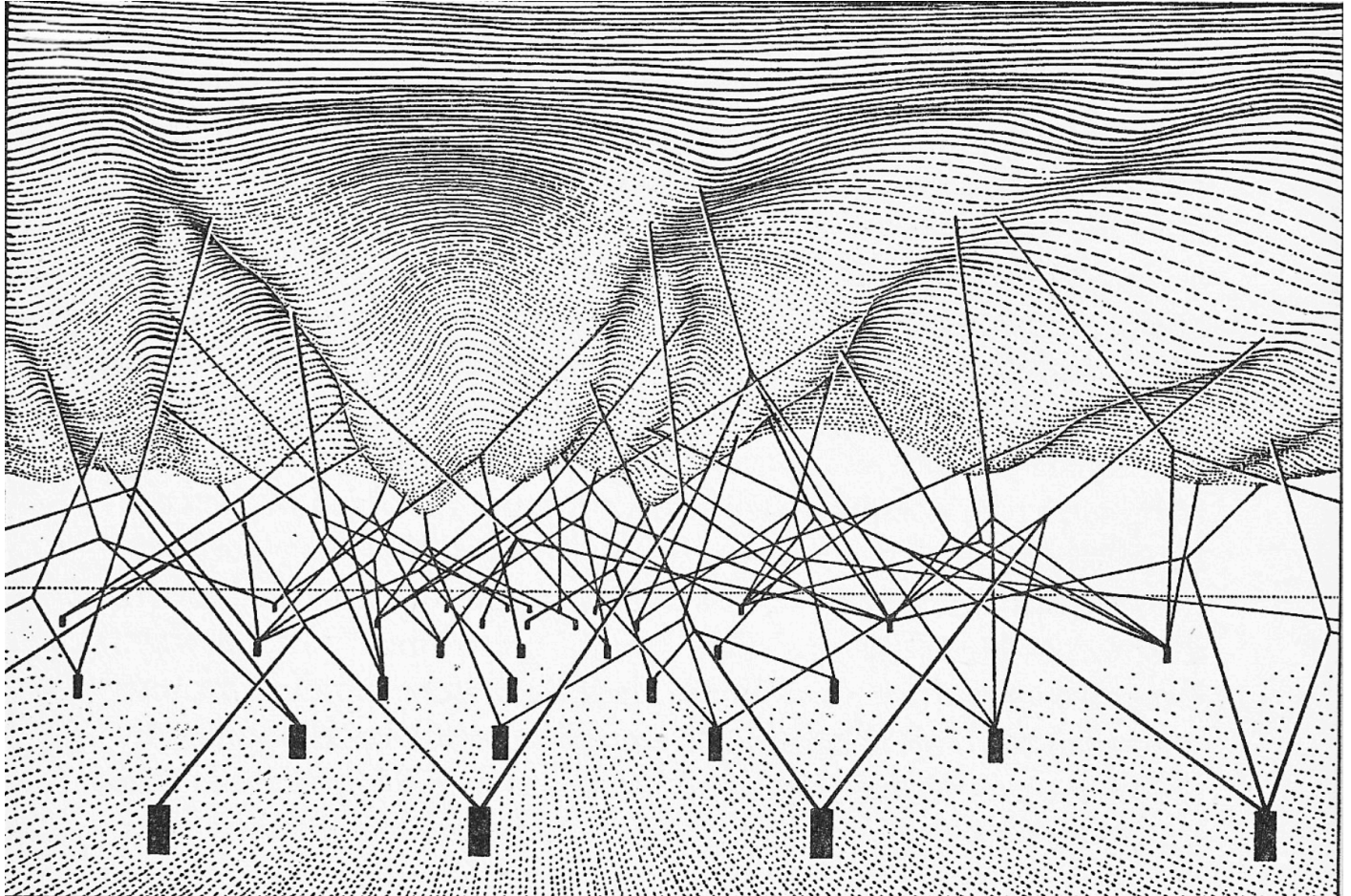
UBC School of Architecture + Landscape Architecture W2 2026

Instructor: Xun Liu, Assistant Professor

Course Credits: 3.0

Schedule: Wednesday & Friday 11:00 a.m. to 12:30 p.m.

GTAs: Lea Papillon, Wylie Moorman



Epigenetic Landscape, Conrad H. Waddington (1957)

Overview

Design Media II is the second course in the BDes media sequence. While DES 211 established the foundations of orthographic representation and manual drawing conventions, this course transitions from digitization to computerization. We explore design media not as a collection of tools for documenting finished ideas but as a generative framework where the logic of the tool informs the evolution of form.

The curriculum is designed to help students navigate the shift from explicit modeling to algorithmic thinking. We focus on industry standard software suites including Rhino, Grasshopper, and Adobe Creative Cloud, while integrating emerging technologies in artificial intelligence and digital fabrication. The goal is to build technical rigor and a conceptual understanding of computational methods that allow students to design and communicate complexity with clarity.

Learning Objectives

Through dedicated engagement with lectures, tutorials, and assignments, students will be able to:

- Systemic Thinking: Transition from drawing static objects to defining the generative rules and relationships that govern architectural form.
- Algorithmic Logic: Employ data hierarchies and conditional structures as primary design drivers rather than administrative constraints.
- Co-creative Intelligence: Navigate the collaboration between human designers and artificial intelligence through prompt syntax and iterative feedback loops.
- Material Agency: Bridge the digital-physical divide by adapting computational logic to the inherent intelligence of physical materials.
- Performative Justification: Use environmental and structural simulation data as a "datascape" to inform and validate design decisions.
- Representational Genealogy: Develop graphic conventions that articulate the computational lineage and process of a design alongside its final output.

Expectations

- Professional Accountability: Mandatory attendance and active engagement in all lectures, work sessions, and pin-ups.
- Technical Autonomy: Mastery through repetition and independent troubleshooting before seeking assistance.
- Ethical AI Usage: Clear attribution of generative outputs and full student responsibility for the logic of AI assisted results.
- Collective Rigor: Constructive peer feedback and proactive sharing of technical insights within the cohort.
- Workflow Integrity: Personal accountability for digital environments, including file backups and dependency management.

Course Structure

The course is organized into three thematic modules:

Module I: The Logic of Form

This module introduces the conceptual foundations of parametric associativity. Students move away from static geometry toward rule based systems where relationships between elements define the design outcome.

Key Topics: Data tree structures, attractor logic, vector fields, and generative patterns.

Objective: Establish a personal workflow in Grasshopper and understand the shift from top down design to emergent methodologies.

Module II: The Intelligence of Matter

This module investigates the feedback loop between digital logic and physical reality. We explore how AI assists in the visualization of form and how digital outputs translate into physical artifacts.

Key Topics: Prompt engineering, image to geometry workflows, 3D printing slicing, and robotic fabrication.

Objective: Demonstrate proficiency in AI assisted design while understanding the material agency in the file to factory process.

Module III: Advanced Form-Finding

The final module introduces performance driven design. Students learn to treat the environment as a source of data that can be injected into the design process to solve complex spatial problems.

Key Topics: Spatial data injection, environmental simulation, and evolutionary solvers.

Objective: Utilize simulation data to achieve specific design performance goals and navigate multi-variable optimization.

Course Format

- **Lectures (Wednesday):** Coverage of history, theory, and computational practice. Attendance is required.
- **Asynchronous Tutorials (Friday):** Self-paced technical sessions to build software proficiency.
- **Work Sessions:** Optional sessions held before pin-ups for technical support and troubleshooting.
- **Miro Pin-ups:** Collaborative review sessions requiring work in progress uploads by 11:59 p.m. the night before the review.

Evaluation and Grading

Grading Breakdown

- Assignment 1: 20%
- Assignment 2: 20%
- Assignment 3: 25%
- Exercises (9 total): 27% (3% each)
- Participation: 8%

Specific Assessment Criteria

Assignments are submitted via Canvas by 11:59 p.m. on the pin-up date. Exercises are assessed on a 3 point scale:

- 3 points: Complete and meets all requirements.
- 2 points: Partially complete or missing key components.
- 0 points: No submission.

Participation is recorded through four random attendance checks (2% each).

Late Policy

Late assignments are docked 5% per day. Late Miro pin-up uploads result in a 10% deduction from the associated assignment grade. Exercises submitted late receive a 1 point penalty. Students are granted one "free" late exercise submission per semester without penalty.

Software and Technical Requirements

Both Windows and macOS environments are fully supported for this course.

- Rhino 8 and Grasshopper: Latest version is required.
- Adobe Creative Cloud: Photoshop and Illustrator.
- AI Tools: Cursors. Free access will be provided to Nano Banana and other online platforms.
- Plugins: Ladybug Tools and others as announced in class.
- Digital Fabrication: Access to 3D printers, CNC machines and robotic arm.
- Digital Design Studio (DDS) Visits: Scheduled visits to the DDS are required for training and fabrication labs.

Schedule

WEEK

WEDNESDAY

FRIDAY

MODULE I: The Logic of Form	1	7 Jan	* L 1.1: COURSE OVERVIEW + DESIGN WITH PARAMETERS <i>Algorithmic thinking history and theory The shift from digitization to computerization</i>	9	T 1.1: HELLO, GRASSHOPPER <i>Grasshopper interface, navigation, and component anatomy Simple demos of creating geometries in GH</i> canvas submission due 1.16
	2	14 Jan	* L 1.2: RULE-BASED DESIGN <i>Top-down design strategies Computational geometries and rule-based form generation</i>	16	T 1.2: GH: ATTRACTORS <i>2D patterns using attractors and image sampler Basic of data trees: graft vs flatten</i> canvas submission due 1.23
	3	21 Jan	* L 1.3: EMERGENT DESIGN <i>Bottom-up design strategies Field conditions and the nature of code</i>	23	T 1.3: GH: FIELDS <i>Vector Field, Transform, Animation Deep into data trees</i> canvas submission due 1.30 DDS Opening Workshop <i>Time TBD Attendance Optional</i>
	4	28 Jan	WORK SESSION I	30	* PIN-UP I <i>Miro pin-up is due at 11:59 PM the day before the review.</i> canvas submission due 1.30
MODULE II: The Intelligence of Matter	5	4 Feb	* L 2.1: AI-ASSISTED DESIGN <i>Prompt engineering as design syntax Image-to-Geometry workflows</i>	6	T 2.1: AI FOR VISUALIZATION <i>Text-to-Image generation Image-to-Mesh generation</i> canvas submission due 2.13
	6	11 Feb	* L 2.2: DIGITAL FABRICATION <i>Mass customization, file-to-factory and material agency Subtractive (CNC) vs. additive (3D print)</i>	13	T 2.2: 3D PRINT <i>Mesh, Nurbs, SubD Mesh repair and slicing</i> canvas submission due 3.6 * DDS LAB VISIT Group A
	7	18 Feb	READING WEEK	20	READING WEEK
	8	25 Feb	* L 2.3: ROBOTIC INTELLIGENCE <i>Robotic fabrication of architecture Human-machine collaboration</i>	27	T 2.3: AI FOR CODING <i>GH scripting components AI as co-pilot</i> canvas submission due 3.6 * DDS LAB VISIT Group B
MODULE III: Advanced Form-Finding	9	4 Mar	WORK SESSION II	6	* PIN-UP II <i>Miro pin-up is due at 11:59 PM the day before the review.</i> canvas submission due 3.6
	10	11 Mar	* L 3.1: DATA-DRIVEN DESIGN <i>Form follows data (datascape) The Informational Context, and mapping the invisible</i>	13	T 3.1: SPATIAL DATA INJECTION <i>Navigating the package manager and Food4Rhino Working with site data and non-spatial data</i> canvas submission due 3.20
	11	18 Mar	* L 3.2: PERFORMANCE-DRIVEN DESIGN <i>Form follows performance Simulation as generative: structural and environmental</i>	20	T 3.2: ENVIRONMENTAL SIMULATION <i>Ladybug basics</i> canvas submission due 3.27
	12	25 Mar	* L 3.3: EVOLUTIONARY DESIGN <i>Theory of evolutionary architecture The iterative process and optimization strategies</i>	27	T 3.3: EVOLUTIONARY SOLVERS <i>Galapagos basics</i> canvas submission due 4.3
	13	1 Apr	WORK SESSION III	3	NO CLASS
	14	8 Apr	* PIN-UP III <i>Miro pin-up is due at 11:59 PM the day before the review.</i> canvas submission due 4.8		

- Lectures
- Pin-ups
- Asynchronous Tutorials
- Work Session
- Break/No Class
- * Attendance Required

Resources and References

Tutorial Resources

The following sources offer extended tutorials and technical support:

- [Grasshopper 3D Tutorials](#)
- [Sine Studio](#)
- [3D Beast](#)
- [Parametric House](#)
- [Generative Landscapes](#)

References

There are no required readings for this course. However, the following publications provide conceptual depth to the topics discussed in lectures:

- Tedeschi, Arturo. *Algorithms-Aided Design (AAD)*.
- Reiser, Jesse, and Nanako Umemoto. *Atlas of Novel Tectonics*.
- Berman, Ila, and Andrew Kudless. *Flux: Architecture in a Parametric Landscape*.
- Carpo, Mario. *The Second Digital Turn: Design Beyond Intelligence*.
- Chaillou, Stanislas. *Artificial Intelligence and Architecture: From Research to Practice*.

University Policies and Standards

AI Policy

The use of Artificial Intelligence (AI) tools, including but not limited to LLMs, image generators, and coding assistants, is not only permitted but actively encouraged as a primary design collaborator in this course. We view these tools as essential to the contemporary design process. However, to maintain academic rigor and transparency:

- Attribution: All AI-assisted content (text, code, scripts, or imagery) must be clearly cited. Documentation should specify which tool was used and for what purpose.
- Responsibility: Students remain fully responsible for the logic, accuracy, and ethical implications of any AI-generated output.

Academic Integrity

The academic enterprise is founded on honesty, civility, and integrity. Students are expected to submit only original work and acknowledge all sources of information or ideas. Plagiarism, cheating, or misleading instructors about the authorship of your work are serious offenses. Violations may result in a mark of zero on the assignment and referral to the President's Advisory Committee on Student Discipline.

Attendance and Academic Concession

Regular attendance is expected. Health problems, conflicts, or other issues preventing work should be brought to the instructor's attention as soon as possible. Students who are unavoidably absent due to illness or disability should report to their instructors upon return. Request for academic concession must be clearly expressed.

Religious Accommodation

If an academic requirement conflicts with your religious practices or observances, you may request reasonable accommodations. Your request must be in writing at least two weeks in advance.

Mental Health and Wellness

UBC recognizes that students may experience barriers to learning due to stress, anxiety, or health concerns.

- UBC Wellness Centre: students.ubc.ca/health/wellness-centre
- UBC Student Assistance Program (SAP): Free, 24/7 wellness resource (1 833 590 1328).
- Crisis Centre BC: Call 1 800 784 2433 or chat online with a responder any time if you are at risk of harm.

Respectful Environment and Safe Space

UBC strives to realize a climate of excellence, equity, and mutual respect. Harassment and discrimination are not tolerated. This course provides a respectful, supportive, and safe space for lesbian, gay, bisexual, queer, transgender, two-spirited, and intersex (LGBTQTTI) persons. If you have concerns, visit positivespace.ubc.ca.

Access and Accommodation

Students with documented disabilities needing academic accommodation should contact the Centre for Accessibility. Any such request should be initiated during the first two weeks of class.

Campus Security

Campus Security is available 24/7 at 604 822 2222 for immediate help or to report suspicious activity.

Land Acknowledgment

UBC's Vancouver campus is situated on the traditional, ancestral, and unceded territory of the Musqueam people. Find out more at students.ubc.ca/ubclife/what-land-acknowledgement.