> *Disciplines are defined by groups of objects, methods, and their corpus of propositions considered to be true, the interplay of rules and definitions, of techniques and tools: all these constitute a sort of anonymous system, freely available to whoever wishes, or whoever is able to make use of them, without there being any question of their meaning or their validity being derived from whoever happened to invent them."*
>
> Michel Foucault, *Archaeology of Knowledge*

In spite of the modern desire for specialization, the historical development of architectural *epistemes* in the latter half of the 20th century and beginning of the 21st century perhaps owe no more to developments generated from within architecture's disciplinary frame than to those variant modes of thought and practice, other 'discursive formations' or disciplinary epistemes, that have influenced it from without.

Against the backdrop of the larger interdisciplinary field known as cultural studies, this course will trace and examine some of the most critical bodies of theory that have influenced the development of contemporary architectural thought and practice since the late 1960s. This course will emphasize and study important writings and theoretical systems that have emerged in various fields including philosophy, art theory/criticism, literary theory, psychoanalysis, the natural and social sciences, mathematics, landscape architecture, urban studies and cultural studies to investigate the ways in which these have generated conceptual tools within architectural theory, criticism and analysis while contributing to the evolution of architectural practice. These "discursive formations" that have evolved in fields outside of architecture form a wider network, a complex interdisciplinary web, within which architecture is situated and against which its practices gain a certain coherence and cultural validity, while also providing the external material that architects have traditionally encountered for the inventive transformation of their practice.

The emphasis of the course both recognizes and affirms that architectural discourse has evolved over the last forty-five years into a self-conscious theoretical discipline that has displaced the centrality of architectural criticism while simultaneously challenging traditional methods of architectural historiography. If one of the primary roles of theory is to produce the concepts by which architecture is related to other forms of cultural practice, architecture, also, through its emerging practices, can be understood to generate new concepts, material "possibilities," of space and inhabitation.

Pedagogic Objectives: To present a thematically organized survey of contemporary architectural theory that focuses on the relationship between seminal theoretical texts (drawn from outside of the architectural discipline) and critical developments in contemporary architectural theory and practice. The course is intended to provide students with an advanced knowledge base in contemporary architectural theory to ground more specialized architectural theory electives while acting as a support for thesis and other forms of advanced architectural research.

The course will cover a wide spectrum of positions and will bring together important readings from thinkers in many areas outside of the architectural discipline and bring these into relation with architectural theorists, practitioners and contemporary works of architecture, landscape, and urbanism. The course is intended to promote thoughtful debate and to enable students to understand the larger theoretical contexts within which contemporary positions in architecture, urbanism, and design culture are situated and to help them with a larger body of reference materials to also position their thesis work. A secondary objective of this course is to develop a framework for formulation and evaluating the architectural thesis relative to contemporary discourse through the discussion of seminal works and projects in the field.

CLASS SCHEDULE
Class Times: Tuesdays 6:30pm-9:30pm; Room 2026

01.05 **INTRODUCTION**

LITERARY AND LINGUISTIC PARADIGMS

TOPIC 1 **SIGNIFYING ARCHITECTURES:**
01.12 **CULTURAL MYTHOLOGIES, SEMIOTIC SYSTEMS AND THE EMERGENCE OF THE TEXTUAL FIELD**

TOPIC 2 **THE CRISIS OF REPRESENTATION:**
01.19 **POST-STRUCTURALISM, POST-FUNCTIONALISM, POST-CARTESIANISM**

PHILOSOPHICAL AND AESTHETIC PARADIGMS:

TOPIC 3 **PHENOMENOLOGY AND THE ARCHITECTURE OF CORPOREAL EXPERIENCE**
01.26

TOPIC 4 **RADICAL PHENOMENOLOGY:**
02.02 **FROM THE EMERGENCE OF SMOOTH SPACE TO ANIMATE ARCHITECTURES**

SOCIAL/POLITICAL AND URBAN PARADIGMS:

TOPIC 5 **THE POLITICS OF ARCHITECTURAL REALISM**
02.09 **DIAGRAMS AND DATASCAPES**

02.16 *no class-Reading Week*

SCIENTIFIC, TECHNOLOGICAL AND MATHEMATICAL PARADIGMS:

TOPIC 6 **CHAOS, COMPLEXITY AND NON-LINEAR DYNAMICS**
02.23

TOPIC 7 **FROM INDUSTRIAL UTOPIA TO DIGITAL E-TOPIAS**
03.02 **POSTHUMANISM: CYBORGS, THE CITY OF BITS AND INTERACTIVE ENVIRONS**

TOPIC 8 **PARAMETRICISM AND THE ALGORITHMIC MODEL:**
03.09 **GENETIC ARCHITECTURES AND NON-STANDARD FORMS OF REPRODUCTION**

ENVIRONMENTAL, ECOLOGICAL AND BIOLOGICAL PARADIGMS:

TOPIC 9 **GEOLOGICS AND PERFORMATIVE SURFACES:**
03.16 **FROM LANDFORM BUILDING AND LANDSCAPE URBANISM TO DROSSCAPES AND THE RECYCLING OF TERRITORIES**

TOPIC 10 **ECOLOGICS AND ARCHITECTURAL BIOMIMESIS**
03.23

TOPIC 11 **FROM ENERGY TO ATMOSPHERE:**
03.30 **THE DISSOLUTION OF THE ARCHITECTONIC**

04.20 *FINAL PAPERS DUE*

LIST OF TOPICS

Week 0 **INTRODUCTION**

Part I: From Meaning to Materiality

LITERARY AND LINGUISTIC PARADIGMS

TOPIC 1 SIGNIFYING ARCHITECTURES:
Week 1 **CULTURAL MYTHOLOGIES, SEMIOTIC SYSTEMS AND THE EMERGENCE OF THE TEXTUAL FIELD**

In the late 1960s and 1970s, issues of "meaning" dominated the architectural climate. In opposition to the formal, functional and technological emphasis of modernism, architectural objects were being rethought as significant cultural artifacts imbued with meaning. An understanding of core texts drawn from the disciplines of Linguistics and Literary Theory/Criticism such as Ferdinand de Saussure's Course in General Linguistics and Charles Sanders Peirce's typological Theory of Signs provides the background necessary to elucidate how theories of language and literature formed the basis for the analysis and design of architectural objects and events following in the wake of modernism. Following Saussure, the writings of Roland Barthes (Elements of Semiology, Mythologies) investigate how cultural spaces and practices can be understood as modern "mythologies" that may be analyzed as complex semiotic systems. During this time, the application of semiotic theories to architecture permeate the writings of a number of architects and theorists including Mario Gandelsonas, Diana Agrest, Alan Colquhoun, and Geoffrey Broadbent.

If the "textualization" of architecture in the 70s and 80s was a critique of modernism's rejection of mimesis, the renewed interest in signifying systems and their theoretical application to architecture was part of a larger interest in representation in general and its relation to symbolism, figuration, and typology. This return to representation is evidenced in the populism, contextualism and aesthetics of banal convention in the work of Robert Venturi and Denise Scott Brown as well as in the figurative historicism of Aldo Rossi, Leon Krier, Michael Graves, and others. Despite the renewed concern with figuration, the figure of the Postmodern remains fragmented as the systematic and coherent whole of a utopic modernism is displaced by the collage, the heterotopic assemblage and the textual field. The writings of Levi-Straus on "bricolage," Foucault on "heterotopias" and Roland Barthes on the "text," are critical to understanding the theoretical implications of the assemblage as it is evidenced in architecture in the writings of Colin Rowe and Fred Koetter in Collage City, Robert Venturi in Complexity and Contradiction as well as the writings and work of Michael Graves, Ben Nicholson and Rem Koolhaas on collage. The fragmentation of the "figures" of architecture emerge in conjunction with the critique and dismantling of semiotic systems [language] and the mobilization of textual space in the literary criticism of Roland Barthes ("From Work to Text"), and the philosophical writings of Jacques Derrida and Gilles Deleuze.

The Primary Foundations of Semiotics includes two principal theories:
- Ferdinand Saussure's Course in *General Linguistics,* eds. Charles Bally and Albert Sechehaye, trans. Wade Baskin (1966), pp. 111-122; and
- Charles Sanders Peirce's "Logic as Semiotic: The Theory of Signs," in *Philosophic Writings of Peirce* (1955).

Further important developments in Semiotic Theory include:
- Roland Barthes Elements of Semiology (trans. Annette Lavers, 1967 and "Myth Today" from *Mythologies*
- Gilles Deleuze and Félix Guattari, "November 20, 1923: Postulates of Linguistics," from *Thousand Plateaus: Capitalism and Schizophrenia,* trans. Brian Massumi (1987), pp. 75-110 (spec. 92-110)

Readings:
- Ferdinand Saussure's Course in *General Linguistics,* eds. Charles Bally and Albert Sechehaye, trans. Wade Baskin (1966), pp. 111-122 (excerpt);
- Culler, Jonathan, "The Linguistic Foundation," from Structuralist Poetics: Structuralism, Linguistics and the Study of Literature (1975); pp. 3-20.
- Geoffrey Broadbent, "A Plain Man's Guide to the Theory of Signs in Architecture" (1977), in Kate Nesbitt, pp. 122-40)
- Mario Gandelsonas, "Linguistics in Architecture (1973) in Michael Hays, pp. 112-131.

TOPIC 2 THE CRISIS OF REPRESENTATION:
Week 2 **POST-STRUCTURALISM, POST-FUNCTIONALISM, POST-CARTESIANISM**

Modern formalism—the belief that in order to understand art and architecture we need only understand its "intrinsic" formal and spatial qualities—was a modern proposition criticized by all forms of postmodernism that emphasized the return to meaning and representation. Nonetheless, there were those, such as Peter Eisenman, who continued the modern project (even while mounting its critique) by claiming, even within the context of semiotics, to work on the 'syntactical' (relational) aspects of the architectural language. Postmodernism has thus been understood both as a reaction to modern formal, technological and functional paradigms, as well as that which continues the project of modernism while subjecting it to critical re-evaluation within the cultural conditions of a late capitalist society. This critique, which rejected the wholesale displacement of the modern by historical and populist models, was fueled by Post-structural theory, focusing on the continuation, yet critical re-evaluation of the modern project through the development of post-Cartesian models of architectural form as space as evidenced in the work of Eisenman, Gehry, Hadid, Libeskind, Tschumi, Coop Himmelblau, Mark Wigley, Jeff Kipnis, Rem Koolhaas and others. Influenced by the Post-structuralist theory of Jacques Derrida, Michel Foucault, and Gilles Deleuze, these architects and theorists rejected the regressive and conservative aspects of postmodernism, its anti-architectural populism, historicist imagery, complacent contextualism, rejection of technology, and repression of the experimental within architectural practice. De Sola Morales's "Weak Architecture," Bernard Tschumi's "Architecture and Disjunction" and Mark Wigley's writings on "Deconstructivist Architecture" claim that the idea of the ordering of objects as a reflection of the order of the world according to a closed stable system or one directed toward a future ideal whole (or a unified harmonious subject) is conceptually inapplicable within the plurality, disjunction and complexity of the contemporary context. Deconstruction as a strategy in architecture therefore attempts to interrogate it's 'stable truths' or structural principles (such as form follows function, truth to materials, requisite hierarchies, etc.) and to subvert and destabilize the edifice by demonstrating that the ground on which it is erected is insecure

Readings:
- Mary McLeod, "Architecture and Politics in the Reagan Era: from Postmodernism to Deconstructivism," (1989), in Hays, pp. 678-702.
- Peter Eisenman, "The End of the Classical: The End of the Beginning, the End of the End." (1984-85), in Hays pp. 522-38.
- Ignasi de Sola-Morales, "Weak Architecture," (1987), in Hays, pp. 614-623.
- Bernard Tschumi, "Disjunctions" and :De, Dis-, Ex-" from *Architecture and Disjunction* (Cambridge, MA: MIT Press).
- Mark Wigley, "Deconstructivist Architecture," in *Deconstructivist Architecture* (New York: The Museum of Modern Art).

PHILOSOPHICAL AND AESTHETIC PARADIGMS:

TOPIC 3 PHENOMENOLOGY AND THE ARCHITECTURE OF CORPOREAL EXPERIENCE
Week 3

The relationship between Phenomenology in Philosophy and Expressionist theories in Art and Architecture can be studied by tracing the development of Phenomenology and reading key philosophical texts through the lineage of Husserl, Heidegger, and Merleau-Ponty. Phenomenology asserts that our primary form of knowing does not exist separately from our body's corporeal structure and its engagement with the world. Within phenomenology it is the apprehension of things in the world through and by the senses by a living and breathing body that constitute the grounding of experience and it is this that is privileged above all other forms of knowledge about that experience. The application of Heideggerian theories of phenomenology to architectural thought in the writings of Alberto Perez-Gomez, Christian Norberg Schulz, Kenneth Frampton and Juhani Pallasmaa will be critiqued through the later writings of Merleau-Ponty and Elizabeth Grosz on the lived body and the phenomenon of corporeal experience. Drawing from Elaine Scarry's book: *The Body in Pain,* this topic will also investigate the ways in which we project our 'sentience' into the world as a form of world making. Through this topic architectures will be studied that position themselves within the context of a phenomenological ideology such as the work of Peter Zumthor and his writing on the privileging of materiality and the atmosphere of architecture (*Atmospheres*), as well as works, such as those of Herzog & DeMeuron (*Natural Histories*) that privilege perceptual and corporeal experience.

Readings:
- Merleau-Ponty, Maurice, "Eye and Mind." *The Primacy of Perception*. (1964). (excerpt)
- Grosz, Elizabeth. "Lived Bodies: Phenomenology and the Flesh." (On Merleau Ponty) in *Volatile Bodies.* (1994).
- Elaine Scarry. "The Interior Structure of the Artifact," in *The Body in Pain.*
- Böhme, Gernot. "Atmosphere As The Subject Matter of Architecture" in *Natural Histories*. Herzog and de Meuron, Switzerland. (2005).

TOPIC 4 **RADICAL PHENOMENOLOGY:**
Week 4 **FROM THE EMERGENCE OF SMOOTH SPACE TO ANIMATE ARCHITECTURES**

The extension of phenomenology to its radicalization—where the intertwining of perception and the world, and the blurring of the subject-object and subject-space dyads are taken to their limits—defines the smooth space of becoming intrinsic to the philosophical writings of Gilles Deleuze (and his psychoanalytic partner Félix Guattari) in *A Thousand Plateaus* and in his writings on Francis Bacon in *The Logic of Sensation*, Jean François Lyotard's philosophy ("Aesthetic Antagonisms") and feminist psychoanalyst Luce Irigaray in her writing: "The Mechanics of Fluids." Radical phenomenology is grounded in a material philosophy that posits at its core, that the anthropocentricism and humanism of traditional phenomenology cannot be reconciled with a philosophy based on the logics of matter that reconceives subject and object as a series of flows, energies, and intensities no longer understood within stable boundaries and demarcated limits but rather as deterritorialized forces in continuous relation with their environment. The writings of Deleuze has had a larger influence on architecture than perhaps any philosopher in the last thirty years. His philosophical writings will be studied in relation to contemporary models of matter within architecture through the work of Reiser + Umemoto (*The Atlas of Novel Tectonics*) and UNStudio (*Design Models*) and the rethinking of the fluid and animate within the work and writing of Greg Lynn (*Animate Form,* and *Folds, Bodies & Blobs*).

Readings
- Deleuze, Gilles and Félix Guattari. "The Smooth and the Striated" *A Thousand Plateaus: Capitalism and Schizophrenia*. (1987) or Deleuze, Gilles. "Nomad Art: Space." *The Deleuze Reader*. Constantin Boundas, ed. (1993): 165-172. [excerpt from "The Smooth and the Striated"]
- Deleuze, Gilles. "Painting and Sensation" and "The Diagram." *The Deleuze Reader*. Constantin Boundas, ed. (1993): 187- (reference: Deleuze, Gilles *Francis Bacon: The Logic of Sensation*).
- Lynn, Greg. "Animate Form." *Animate Form.* (New York: Princeton, 1998).
- Reiser + Umemoto. *The Atlas of Novel Tectonics.* (New York: Princeton, 1998). (specific excerpts)

Part II: From Object to System

SOCIAL/POLITICAL AND URBAN PARADIGMS:

TOPIC 5 **THE POLITICS OF ARCHITECTURAL REALISM**
Week 5 **DIAGRAMS AND DATASCAPES**

Polemical writing and widely published projects over the last decade and a half have invoked the theme of the "real" in architecture. This tendency has been in part a reaction to the apparent overvaluation, in the early part of the preceding decade, of representation, and its co-optation into an overarching culture of the image. It has also been a form of resistance to the virtual image and to architecture that appears to take the virtual image as its model by, as in the case of architects such as SHoP, focusing on the process and practice of building. In its most familiar form, the theme of the real has drawn its energy from an ethical and critical stance towards the act of making, on the one hand, and the necessity of engagement with the messy realities of architecture and urbanism on the other. The desire, within modernity to translate scientific, social, technological and economic realities into form was of course a result of the value that these domains had within the modern and the power that these had over the making of architecture. The resistance of architecture to operate as the 'handmaiden' to such structures in the postmodern era also led to a form of solipsism—criticized as 'paper architecture'—whose engagement with the social and political realities of building cities was minimal. The return to realm of the real by practices such as the Office of Metropolitan Architecture (OMA) led by Koolhaas, were critical in producing a second generation of architects, such as MVRDV whose response to the information age was to engage the organizational structures of the real through the manipulation of data—facts and figures that operate as signifiers of the real. For MVRDV, understanding and designing with parametric data operates

as a form of 'research' that replaces artistic intuition, enabling hypothetical arguments to be proposed that engage the quantifiable forces that influence or define and control the architects work. Their larger argument, especially in relation to the city, is that numbers, policies, and rules that apparently have nothing to do with architectural form have a greater effect on the shape of cities than architecture.

Readings

- Antonio Negri and Michael Hardt. *Empire* (Cambridge & London: Harvard University Press, 2000)
- Winy Maas and MVRDV. *Metacity/Datatown* (Rotterdam : MVRDV/010 Publishers, 1999)
- Rem Koolhaas. "What Ever Happened to Urbanism?" in *Small, Medium, Large, Extra Large* (New York: Monacelli Press, 1995): 958-971.
- Michael Speaks. "Design Intelligence and the New Economy," *Architectural Record* (January 2002): 72-79.

SCIENTIFIC, TECHNOLOGICAL AND MATHEMATICAL PARADIGMS:

TOPIC 6 CHAOS, COMPLEXITY AND NON-LINEAR DYNAMICS
Week 6

While Deleuze and Guattari might give us a philosophical understanding of complexity through their model of the "rhizome," complexity theory in the sciences—what has been referred to as the new science of nonlinear dynamics in mathematics, physics, and chemistry—gives us another disciplinary paradigm for modeling the behaviour of complex systems far from equilibrium. While classical (Euclidean) geometry was seen as a powerful abstraction that inspired a philosophy of platonic harmony, it could not have been further from the real. Benoit Mandelbrot, one of the critical figures of fractal mathematics wrote: 'clouds are not spheres, and mountains are not cones. Lightening does not travel in a straight line. The new (fractal) geometry mirrors a universe that is rough, not rounded, scabrous, not smooth. It is a geometry of the pitted, pocked, and broken up, the twisted, tangled and intertwined. The understanding of nature's complexity awakened a suspicion that this complexity was not just random or accidental' but rather referred to a particular and patterned distribution. (James Gleick: *Chaos: The Making of a New Science*). This "new science" is inherently dynamic and evolving, entirely displacing the closed mechanistic world view that ended at the beginning of the 20th century when Einstein's theory of relativity dismantled Newton's universe of absolute space and time, and quantum theory challenged the idea that matter was static, solid and determinate. In *Order out of Chaos,* Ilya Prigogine and Isabelle Stengers 'argue that traditional science in the Age of the Machine tended to emphasize stability, order, uniformity, and equilibrium. It concerned itself mostly with closed systems and linear relationships in which small inputs uniformly yield small results. With the transition from an industrial society based on heavy inputs of energy, capital, and labor to a high-technology society in which information and innovation are the critical resources, it is not surprising that new scientific world models should appear. Their work operates not only as a model for science but characterizes a reality of accelerated social change: disorder, instability, diversity, disequilibrium, and nonlinear relationships (where small inputs can trigger massive consequences).' Kellert defines chaos theory as "the qualitative study of unstable aperiodic behavior in deterministic nonlinear dynamical systems." The work of Prigogine/Stengers defined systems of order and organization that arise out of disorder through processes of 'self-organization' paralleling research by others on emergent forms of behaviour such as Rene Thom on morphogenesis and William Bateson among others. Emergence, self-organization, morphogenesis and complexity theory have influenced architectural work and will be studied through the research and work of Lars Spruybroek of NOX, Michael Weinstock, Michael Hensel (Ocean North), Greg Lynn, Toyo Ito and others.

Readings

- Ilya Prigogine and Isabelle Stengers. *Order Out of Chaos: Man's New Dialogue with Nature.* (New York: Bantam, 1984). (introduction)
- Gleick, James. "A Geometry of Nature." *Chaos: Making a New Science*.
- Steven Johnson. "The Myth of the Ant Queen," *Emergence: The Connected Lives of Ants, Brains, Cities and Software*. (New York: Scribner, 2001): 29-67.
- Hensel, Michael, Achim Menges and Michael Weinstock, eds. *Emergence: Morphogenetic Design Strategies*. AD Architectural Design Vol. 74, 3 (London: John Wiley & Sons, 2004). (Introduction)
- Lars Spuybroek. "The Structure of Vagueness," in *The Architecture of Continuity.* (Rotterdam: NAi, 2008) and in *NOX: Machining Architecture* (London: Thames & Hudson, 2004).
- Achim Menges."Polymorphism," *Techniques and Technologies in Morphogenetic Design, AD 76*, no2, (March/April 2006): 78-97. also in " in Mario Carpo ed. *The Digital Turn in Architecture: 1992:2012.* (Chichester: John Wiley & Sons, 2013).

TOPIC 7 FROM INDUSTRIAL UTOPIA TO DIGITAL E-TOPIAS
Week 7 **POSTHUMANISM: CYBORGS, THE CITY OF BITS AND INTERACTIVE ENVIRONS**

Just as the industrial revolution transformed architectural practice in the first half of the twentieth century, the digital revolution at the end of the millennium substantially changed not only the way in which we make architecture, but also our spatial conceptions and our understanding of subjectivity. Whereas Donna Haraway's redefinition of the "cyborg" provides a theoretical context which challenges the authenticity and immediacy of phenomenological experience and Rosi Bradotti's book *Posthumanism* questions the anthropocentric reading of subjectivity, Bill Mitchell's book "City of Bits" (as well as Fard and Meshkani's *Geographies of* Information) investigate the way in which the "net" has transformed our ideas of space, place and identity. The amplification and pervasiveness of information technologies within our contemporary environment has led to a new informational and interactive paradigm, both theoretical and physical, within architectural practice. On the one hand, the micro-scale of miniaturized technologies coupled with our extended computational capability have enabled us to program matter—to render it intelligent through interactive embedded micro-processing technologies that have expanded the potential use value and performative capacity of designed objects. On the other hand, the idea that buildings would operate as programmable exchange terminals within a larger and more complex urban network, is symptomatic of our reconceptualization of architecture according to a cybernetic and informational paradigm. As this augmented understanding of "program" incorporates and adapts to the feedback of users, environments or other living systems through "smart" sensory surfaces or kinetic enviro-responsive building skins, for example, architecture becomes interactive while emulating the dynamic properties of the contexts in which it is embedded. Responsive systems are used to express the choreography of inhabitation, respond to the shifting needs or animate behaviors of occupants, or react to changing micro-climates through the filter of an interactive gradient field in continual flux. Architecture is thus deployed as an intelligent and communicative infrastructure that organizes the variable spectra of potential responses and that dynamically stimulates and enables the expressive production of a multitude of artificial atmospheric, material or techno-spatial effects. And just as mass-customization allows us to democratize rather than standardize design, Carlo Ratti—director of MIT's Senseable City Lab—postulates that interactive systems replace the generic user with one whose activities or transient preferences become hyper-individualized not only within space, but also within time.

The topics as part of this theme explore the intersection between interactive information technologies and architectural space through multi-scaled interfaces that act as responsive agents in continual communication with their environs. This includes the investigation of the technological interface between digital information and the scale and operation of the city, focusing on urban performance and data-based infrastructural networks as well as the impact of media on civic space through the evolution of web-based social networks. The "city of bits" projects us into a future interactive McLuhan-esque environment of "billions upon billions of addressable sub-objects" where information technologies transform not only our organizational systems, research methods, and social structures (and thus our human agency), but also the sentience of our bodies through amplified sensory prostheses embedded within rapidly intensifying interactive environments.

Readings:
- Donna Haraway, "A Manifesto for Cyborgs" in *Simians, Cyborgs, and Women: The Reinvention of Nature.* (New York: Taylor & Francis, 1991): 149-182.
- Rosi Bradotti, "The Posthuman as Becoming-Machine," in *Posthuman* (Cambridge: Polity, 2013).
- Bill Mitchell *City of Bits: Space, Place and the Infoban.* Cambridge, MA: MIT Press, 1999.
- Fox, Michael and Miles Kemp. *Interactive Architectures.* (New York: Princeton Architectural Press, 2009)

TOPIC 8 PARAMETRICISM AND THE ALGORITHMIC MODEL:
Week 8 **GENETIC ARCHITECTURES AND NON-STANDARD FORMS OF REPRODUCTION**

The algorithmic computational model has transformed architectural practice, whereby digital technologies have evolved from being simply representational tools invested in the depiction of existing models of architectural space to becoming significant performative machines that have transformed the ways in which we conceive and configure form, space and material. These technologies are driven by algorithmic mathematical logics that have enabled the emergence of a new parametric practices emulating genetic and iterative dynamic evolutionary (and morphogenetic) processes that function at multiple scales and in different domains. These are radically changing the ways in which we integrate disparate types of material information into the design process, while altering methodologies directly influencing both design and manufacture. That our current models of space are far more continuous, variant and complex is specifically a result of

the tools we are using to produce them, an inevitable byproduct of the influence of algorithmic logics on architectural practice and the ever-expanding capacities of digital computation and related fabrication technologies. In his *Parametricist Manifesto*, Patrick Schumacher defines the desire of the parametric model as "continuous differentiation"—the development of design tools that 'allow the precise formulation and execution of intricate correlations between elements and subsystems … or the populating of modulated surfaces (and systems) with adaptive components … so that the overall component might sensibly adapt to various local conditions. As they populate a differentiated surface their adaptation should *accentuate and amplify* this differentiation. This relationship between the base component and its various instantiations at different points of insertion in the "environment" is analogous to the way a single geno-type might produce a differentiated population of (architectural) pheno-types in response to diverse environmental conditions.' A parametric process involves rules and operations, and methods of transcoding information. Design operates through devising the rules of this system, rather than its final product, whereby a hypothesis is tested by changing either the parameters or the inputs which then generate, through their genetic coding, different design iterations that are akin to distinct mutations in a species.

Readings:

- Schumacher, Patrik. "Parametricism: A New Global Style for Architecture and Urban Design," SHoP. "Versioning" and Greg Lynn "Embryologic Houses." in Mario Carpo ed. *The Digital Turn in Architecture: 1992:2012.* (Chichester: John Wiley & Sons, 2013).
- Meredith, Michael. "Never Enough." in Tomoko Sakamoto. *From Control to Design: Parametric/algorithmic Architecture*. (Barcelona: Actar-D, 2008).
- Alejandro Zera-Paolo, "Breeding Architecture," *The State of Architecture at the Beginning of the 21st Century* eds. Bernard Tschumi and Irene Cheng (New York: Monacelli Press, 2003): 56-57.
- Aranda, Benjamin and Chris Lasch. "What is Parametric to Us" and "Out of Order." in *From Control to Design: Parametric/Algorithmic Architecture* and *Tooling* (New York: Princeton Architectural Press, 2006)
- Burry, Mark. "Cultural Defence" in *Scripting Cultures: Architectural Design and Programming*. (London: Wiley, 2011).

ENVIRONMENTAL, ECOLOGICAL AND BIOLOGICAL PARADIGMS:

TOPIC 9 **GEOLOGICS AND PERFORMATIVE SURFACES:**
Week 9 **FROM LANDFORM BUILDING AND LANDSCAPE URBANISM TO DROSSCAPES AND THE RECYCLING OF TERRITORIES**

The shift from an emphasis on the architectural object to its 'ground' or 'territory' arises in concert with the emergence of material philosophy and its intrinsic relationship to the 'environment.' This, in addition to the displacement of the objects of urbanism with their underlying infrastructural systems, enabled the simultaneous emergence of landform building as a redefinition of architecture as a recontextualized 'ground' on the one hand, and landscape urbanism as a new model for a decentralized urbanization on the other. An interrogation of the conditions organizing surface territories rather than the weighty apparatus of urban objects, as well as the rethinking of architecture in terms of its materiality and performance rather than simply its form—especially against the backdrop of an ever-increasing environmental awareness—thereby allowed for the concept of the territorial field and the rise of the discipline of landscape as a model to rethink the architectural project. In "Terra Fluxus" James Corner refers to cultural geographer David Harvey's critique of both Modern and New Urbanist approaches to design claiming that both fail because of their emphasis on spatial form and aesthetic appearance and 'their presumption that spatial order can control history and process' and instead calls for the advancement of "more socially just, politically emancipatory, and ecologically sane mix(es) of spatio-temporal production processes." For Corner, these processes are integral to landscape when understood through an ecological lens where the dynamic integration of flows becomes paramount and 'terra firma' is displaced by 'terra fluxus.'

Readings

- Stan Allen. "From Object to Field". *In Architecture after Geometry, Architectural Design, Vol 67,* No 5/6 (May-June 1997): 24-31.
- James Corner. "Terra Fluxus," in *Landscape Urbanism Reader*, ed. Charles Waldheim (New York: Princeton Architectural Press, 2006): 22-33.
- Charles Waldhiem. "Landscape as Urbanism," in *Landscape Urbanism Reader*, ed. Charles Waldheim (New

York: Princeton Architectural Press, 2006): 34-53.
- Allan Berger. "Urban Land is a Natural thing to Waste. Seeing and Appreciating Drosscapes", *Harvard Design Magazine no 23* (Fall 2005/Winter 2006): 48-56. see also: Berger, Alan. *Drosscape. Wasting Land in Urban America*, Princeton Architectural Press, 2007.

TOPIC 10 **ECOLOGICS AND ARCHITECTURAL BIOMIMESIS**
Week 10

The 'environmental issue' has never been so prevalent within architectural discourse, asking us to interrogate the many assumptions that have governed our approach to energy and ecology within contemporary practice. The concept of 'eco-logics' extends our thinking about the environment by asking us to re-conceptualize architecture itself through ecological models—to imagine it as a dynamic, integrative and interconnected ecosystem to be assessed, not in terms of its objecthood, but rather in relation to the multiple valences of its performance. To understand, for example, the larger effects of environments on populations, or conversely, the evolution of architecture in terms of the diversification and adaptation of species and their habitats—from niche theory to biomimicry—points less to our technological prowess when confronting environmental issues, than to the importance of the conceptual frameworks through which we define our discipline. Architecture's direct engagement with the biotic and organic has been explored in many different forms often through the generation of 'synthetic natures'. From landscape urbanism's active production of artificial terrain to the incorporation of new vegetal cladding systems, this topic investigates the effects of new architectural bio-technologies and the conceptual, technological and aesthetic issues surrounding the proliferating living landscapes embedded within the surfaces and spaces of our emerging agropolis. And finally, against the backdrop of rampant species' extinction resulting from the over-extended boundaries of anthropogenic settlement, resource consumption, and industrial pollution, architectural environmental bio-politics asks us to reconsider a truly post-humanist environment in the service of, or in concert with, species and ecologies other than our own. Under this topic we will study critical writings on ecology and biopolitics from Timothy Morton and Janine Benyus to Cary Wolfe, while investigating architecture's variable responses to the eco-logical and biomimetic paradigms.

Readings
- Hensel, Michael and Achim Menges. "Theoretical Framework," in *Emergence: Morphogenetic Design Strategies: Towards a Biological Paradigm for Architecture*. (London: Wiley, 2004).
- Hight, Christopher. "Designing Ecologies" in Chris Reed and Nina-Marie Lister (eds) *Projective Ecologies.* (Cambridge: Harvard GSD, 2014).
- Morton, Timothy . *The Ecological Thought.* (Cambridge: Harvard University Press, 2010). (excerpt)
- Ellis, Erie C., "Ecologies of the Anthropocene: Global Upscaling of Social-Ecological Infrastructures" in Daniel Ibañez & Nikos Katsikis eds. *New Geographies: Grounding Metabolism*. (Cambridge: Harvard GSD, 2014).
- Wolfe, Cary. "Lose the Building: Form and System in Contemporary Architecture." in *What is Posthumanism?* (Minneapolis: University of Minnesota Press, 2010)
- Berman, Ila. "Regenerative Returns." *Cornell Journal of Architecture #8 RE: +/-.* New York: Cornell AAP / Actar (January 2011).

TOPIC 11 **FROM ENERGY TO ATMOSPHERE:**
Week 11 **THE DISSOLUTION OF THE ARCHITECTONIC**

This topic focuses on the complex exchanges and economies of energy, as well as on the gradient flows, atmospheric effects and sensory experiences of the micro-environments that we create, reconsidered as primary material constituents—along with stone, concrete, steel and glass—of buildings and cities. We are asked by Sean Lally to envisage architecture not only as an acculturated physical extension of the geological crust of the earth's surface, but also as the bottom layer of an 'ocean' of air, and invest the same degree of design intelligence and invention into the organization of its thermodynamic, acoustic and electromagnetic milieus. "The intention isn't to simply trade in one form of boundary (surfaces) for another (gradients) assuming all else will remain the same. In looking to these material energies, the intention is to seek out the spatial, social and organizational implications they will have as we give architecture new shapes, aesthetics and typologies that come from such a fundamental shift in how we define the physical boundaries of our spaces. One that for so long has been based on mediating its environmental context by building with surfaces to one that amplifies the very energies around us to define and build our architectural shapes. This includes not only how we control these materials but how our body's sense and perceive these gradient boundaries." (Lally) This topic will investigate the current dissolution of the 'architectonic' through the research and

practice of those such as Sean Lally (Weathers) and Philippe Rahm (on Meteorological Architecture) as well as works by Olafur Eliasson (Mediated Motion and the Weather Project) whose emphasis is on the design of immersive environments constituted by the production of atmospheres rather than form.

Readings

- Addington, Michelle. "Contingent Behaviors" in Sean Lally ed. *Energies: New Material Boundaries.*
- Lally, Sean. "Twelve Easy Pieces for the Piano." in *Energies: New Material Boundaries*. (London: Wiley, 2009).
- Lally, Sean. *The Air from Other Planets: A Brief History of Architecture to Come*. (Baden: Lars Muller, 2014) (Excerpt)
- Rahm, Philippe. "Meteorological Architecture." in *Energies.* (London: Wiley, 2009).
- Rahm, Philippe. "Toward a Thermodynamic Urban Design." in Daniel Ibañez & Nikos Katsikis eds. *New Geographies: Grounding Metabolism*. (Cambridge: Harvard GSD, 2014).

COURSE MATERIALS:

All course materials which includes the course outline/syllabus, schedule, assignments, and weekly readings will be uploaded to a pbworks wiki site that will be shared by all members of the class. This site will be the locus for updated course materials as well as for ongoing communication from me and for discussion among the class.

TEXTS/REQUIRED READINGS:

Required and supplementary readings will be listed for each class and assigned on a weekly basis. A preliminary outline bibliography with required and a supplemental bibliography is included for each of the 11 Topics of the course. This bibliography and the weekly required readings may be updated over the course of the semester. Required readings are mandatory and are to be read *before* class in order to provide a background to the lectures presented and are critical for the discussion of issues among the group. Any additional supplementary readings in the bibliography listed in the course syllabus are to direct students toward further reading if desired and to provide students with a more developed frame of reference for each of the topics covered. The supplementary bibliography for each topic are also to provide a context for the analytical/theoretical papers or to provide a bibliographic context for students who might pursue any of these topics in relation to their theses.

COURSE REQUIREMENTS:

ATTENDANCE:

Full attendance is required and will be taken at each class (a student will be asked to withdraw from the course if he or she has incurred three or more unexcused absences).

READINGS • PARTICIPATION • PRESENTATIONS:

Active individual and group participation is the primary requirement of this course. You are thus expected to attend seminars well prepared to participate in the ongoing discussion. To this end you are expected to read and complete each of the required main texts/readings outlined in the syllabus for each week (these will be on the wiki site), to have made notes on key points, ideas and concepts, as well as on the structure and effectiveness of the arguments presented, and to come prepared each week to present your thoughts to the class and to engage and participate in a critical discussion of the issues being addressed within the seminar. The "life" of any seminar is dependent on the active involvement on the part of all of the students and it is hoped that each of you will bring to the course energy, enthusiasm, and a questioning, open mind. Come to each class with notes, questions, and provocations and be prepared to engage with your peers. The quality of the seminar will depend on your attendance and participation. Oral participation in the weekly discussions (in addition to the evaluation of your weekly notebooks) will constitute 30% of your final grade.

Topic Presentation

In addition to your weekly contributions to the discussion, you will also be required to make a 15 minute in-class presentation on one of the 11 topics of the seminar and to lead the discussion that follows. You will be asked on the first day of class to select the topic area within which you will make your presentation. Your presentation should take up one of the readings/texts or works covered under the topic, and should try to situate it within the larger paradigm being discussed and attempt to present the key theses or arguments of the work. You should end your presentation with one to two provocative questions to pose to the group for discussion, and will mediate the ensuing discussion. Your presentation and the following discussion will constitute 20% of your grade.

NOTEBOOK:
To encourage close readings of the text materials and to develop an organized approach to critical thinking, it is a requirement of the course that each student record in a notebook and bring to the seminar classes each week a critical outline of, and response to, at least 1-2 of the assigned readings. Each student should be fully prepared to present these outlines and responses when called upon during the seminar. This notebook can include (but should not be limited to) summaries and analyses of the critical ideas or arguments of each of the readings, as well as definitions of important concepts and terms introduced. The notebook should be clearly legible, organized by topic and kept up to date. Class attendance, weekly presentations of readings and class participation/discussion will together comprise 50% of the course grade. You may be asked to digitally submit your notebooks for review at the end of the semester.

FINAL PAPER
Finally, you will be asked to submit a final 2500+ word theoretical paper that elaborates on the topic that you presented in class in relation to either an analysis of a contemporary work of architecture (selected from the architectural works or architects studied under each topic) or developed in relation to your ongoing thesis work that situates it within its theoretical context. In the case of the former, the work you choose to investigate should productively intersect with the thematic topic selected and should be chosen from the potential list of architects/projects suggested for consideration. Students may also select a project or architect not discussed within the course yet must obtain instructor approval. At the outset, you should therefore do three things: 1) select the topic that interests you; 2) develop an outline bibliography of the readings/texts that you will explore from those within the syllabus related to this topic; and 3) select an architectural work to investigate that productively intersects with the thematic topic selected. For those within the first year of the Masters program, you should look at this as an opportunity to begin thinking about your thesis and the topics and precedents that interest you. Students who wish to, may consider writing a theoretical paper that engages some of the core readings of the course without developing an in-depth architectural analysis. Those wishing to do this however must present this as a proposal and obtain instructor approval. Additional Note: The readings of the course provide a framework for your research, yet students are also encouraged to extend and expand the terrain of the course material provided.

You will be asked to submit a 700 word paper abstract and annotated bibliography on Tuesday March 2nd at the beginning of class. This is an initial outline/abstract of the theoretical readings that compose the bibliography for your paper. Select key theoretical issues to focus on in your analysis and try to understand how these issues can be used to theorize, analyze or "read" the work of architecture which you are investigating. Within the context of developing a larger bibliography, you should select 2-3 critical writings that will form the focus for your investigation. Your theoretical outline should clearly define the theoretical focus and concepts being developed in the analysis. You are encouraged to discuss your paper topic with me prior to this submission, and I can suggest appropriate direction and sources.

Final Paper Format:
Format: 8 1/2 x 11, typed, single-spaced, 10 pt font and page-numbered. Length: minimum 2500 words. The paper should be approximately 8-15 typed pages in length and include *excellent* quality, complete visual documentation of the work being analyzed. All visual work should be reduced to an 8 1/2 x 11 inch format and submitted with the paper. Papers should include properly documented footnotes and a full bibliography of all theoretical and visual material. You should use the *Chicago Manual of Style* for your endnotes, bibliography and image citations (http://library.osu.edu/sites/guides/chicagogd.php). The final written submission will consist of a paper (with necessary images, endnotes and bibliography) in pdf format, uploaded to a shared dropbox by 5pm Tuesday April 20th. (The following information should be included on a cover page: the number and name of the course, the instructor's name, the architect of the project, the name of the architectural work analyzed, your name, the date).

Your proposal, abstract and bibliography will constitute 10% of your final grade. Your final paper submission will constitute 40% of your grade.

ASSIGNMENTS/GRADES:

Attendance / Weekly Class Preparation and Notebooks	30%
Presentation of one of the Topics of the class	20%
Final Paper (proposal/abstract/bibliography: 10%)	50%

BIBLIOGRAPHY

General Texts: Contemporary Architectural Theory

- Hays, K. Michael ed. *Architecture Theory since 1968*. Cambridge: MIT Press. 1998.
- Nesbitt, Kate ed. *Theorizing a New Agenda for Architecture: An Anthology of Architectural Theory 1965-1995*. New York: Princeton Architectural Press. 1996.
- Leach, Neil. *Rethinking Architecture: A Reader in Cultural Theory* . Taylor and Francis. 1997.
- Bernard Tschumi and Irene Cheng (eds.), *The State of Architecture at the Beginning of the 21st Century* (New York: The Monacelli Press, 2003).

LITERARY AND LINGUISTIC PARADIGMS

TOPIC 1 SIGNIFYING ARCHITECTURES:
CULTURAL MYTHOLOGIES, SEMIOTIC SYSTEMS AND THE EMERGENCE OF THE TEXTUAL FIELD

The Primary Foundations of Semiotics includes two principal theories:

- Ferdinand Saussure's Course in *General Linguistics,* eds. Charles Bally and Albert Sechehaye, trans. Wade Baskin (1966), pp. 111-122; and
- Charles Sanders Peirce's "Logic as Semiotic: The Theory of Signs," in *Philosophic Writings of Peirce* (1955).

Further important developments in Semiotic Theory include:

- Roland Barthes Elements of Semiology (trans. Annette Lavers, 1967 and "Myth Today" from *Mythologies*
- Gilles Deleuze and Félix Guattari, "November 20, 1923: Postulates of Linguistics," from *Thousand Plateaus: Capitalism and Schizophrenia,* trans. Brian Massumi (1987), pp. 75-110 (spec. 92-110)

Supplemental Bibliography:

- Alan Colquhoun, "Historicism and the Limits of Semiology," and "Sign and Substance: Reflections on Complexity, Las Vegas and Oberlin," *Essays in Architectural Criticism: Modern Architecture and Historical Change* (1981), pp. 128-151.
- Diana Agrest and Mario Gandelsonas, "Semotics and Architecture: Ideological Consumption or Theoretical Work (1973) in Nesbitt, pp. 112-131.
- Goodman, Nelson. "I: Reality Remade," "Denotation," "Imitation," "Fictions," "Representation-as," "Invention," "Realism," "Depiction and Description." *Languages of Art: An Approach to a Theory of Symbols*. (1976): 3-10, 21-43.

TOPIC 2 THE CRISIS OF REPRESENTATION:
POST-STRUCTURALISM, POST-FUNCTIONALISM, POST-CARTESIANISM

Supplemental Bibliography:

- Mark Wigley, "Unbuilding Architecture," from *The Architecture of Deconstruction: Derrida's Haunt* (Cambridge, MA: MIT Press).
- Kate Nesbitt, "Post-structuralism and Deconstruction: Issues of Originality and Authorship," in Nesbitt, pp. 141-98 (Tschumi and Mugerauer, inclusive).
- Jeff Kipnis, "Twisting the Separatrix," (1991), in Hays pp. 708-42
- Robin Evans, "In Front of Lines That Leave Nothing Behind," (1984), in Hays, pp. 480-489.
- Jacques Derrida, "Point de folie—Maintenant l'architecture," in Hays pp. 566-581).

PHILOSOPHICAL AND AESTHETIC PARADIGMS:

TOPIC 3 PHENOMENOLOGY AND THE ARCHITECTURE OF CORPOREAL EXPERIENCE

Supplemental Bibliography:

- Merleau-Ponty, Maurice, "The Intertwining—The Chiasm." *The Visible and the Invisible*. (1968).
- Taminiaux, Jacques. "The Thinker and the Painter." *Merleau-Ponty Vivant*. M. C. Dillon, ed. (1991).
- Irigaray, Luce. "The Invisible of the flesh: A Reading of Merleau-Ponty, The Visible and the Invisible, 'The

Intertwining—The Chiasm'" *An Ethics of Sexual Difference*.
- Zumthor, Peter *Atmospheres*. Birkhauser, Switzerland. (2006).
- Juhani Pallasmaa *The Eyes of the Skin: Architecture and the Senses.* (London: Wiley, 2012).
- Pallasmaa, Juhani. "The Geometry of Feeling: A look at the Phenomenology of Architecture." (1986). [Nesbitt: 447-53].
- Steven Holl, Juhani Pallasmaa and Alberto Pérez-Gómez, Questions of Perception: Phenomenology of Architecture, Special Edition, A+U Publishing (Tokyo), July 1994.
- Perez-Gomez, Alberto. "Introduction." in *Architecture and the Crisis of Modern Science.* (1983). [Hays: 462-75]

TOPIC 4 RADICAL PHENOMENOLOGY:
FROM THE EMERGENCE OF SMOOTH SPACE TO ANIMATE ARCHITECTURES

Supplemental Bibliography
- Irigaray, Luce. "The 'Mechanics' of Fluids." *This Sex Which is Not One.* trans. Catherine Porter. (1985): 106-118.
- Lyotard, Jean François. "Aesthetic Antagonisms." *Paraesthetics.* David Carroll. (1987): pp23-52.
- Lynn, Greg. "Multiplicitous and Inorganic Bodies," and "Probably Geometries: the Architecture of Writing in Bodies." *Folds, Bodies & Blobs: Collected Essays.* (1998).
- Lynn, Greg. "Architectural Curvilinearity: the Folded, the Pliant and the Supple." *Folding in Architecture*. Greg Lynn, ed. (1993).
- de Sola-Morales, Ignasi. "Liquid Architecture." *Anyhow* (1998).
- Cache, Bernard. *Earth Moves: The Furnishing of Territories.*

SOCIAL/POLITICAL AND URBAN PARADIGMS:

TOPIC 5 THE POLITICS OF ARCHITECTURAL REALISM
DIAGRAMS AND DATASCAPES

Supplemental Bibliography
- Aureli, Pier Vittorio. "Toward the Archipelago: Defining the Political and the Formal in Architecture" in *The Possibility of an Absolute Architecture.*
- Brenner, Neil ed. *Implosions / Explosions: Towards a Study of Planetary Urbanization.* (Berlin: Jovis, 2013).
- Harvey, David. "Uneven Geographical Developments and the Production of Space" in *Seven Contradictions and the End of Capitalism.* (New York: Oxford, 2014).
- Jameson, Fredric . *Postmodernism, or the Cultural Logic of Late Capitalism*, London: Verso, 1991.
- Kieran, Stephan and James Timberlake. "Future Worlds. Urgent Reflections on the Design of Practice," in *Practices 7/8* (October 2007): 81-89
- MVRDV, *FARMAX : excursions on density*, Rotterdam : 010 Publishers, 1998.
- Scott, Felicity. *Architecture or Techno-Utopia: Politics after Modernism.*

SCIENTIFIC, TECHNOLOGICAL AND MATHEMATICAL PARADIGMS:

TOPIC 6 CHAOS, COMPLEXITY AND NON-LINEAR DYNAMICS

Supplemental Bibliography
- René Thom. *Structural Stability and Morphogenesis: An Outline of a General Theory of Models.* trans. D. H. Fowler (Reading, MA: Addison-Wesley, 1989).
- Ilya Prigogine and Isabelle Stengers. *Order Out of Chaos: Man's New Dialogue with Nature.* (New York: Bantam, 1984).
- Stephen Kellert. *In the Wake of Chaos: Unpredictable Order in Dynamical Systems.* (Chicago: Chicago University Press, 1993).
- Katherine Hayles. Chaos and Order: Complex Dynamics in Literature and Science (1991),
- Lars Spuybroek, *Research & Design: The Architecture of Variation*. (New York: Thames & Hudson, 2009).
- Weinstock, Michael. *The Architecture of Emergence: The Evolution of Form in Nature and Civilisation.* (London: Wiley AD, 2010).
- Hensel, Michael, Achim Menges and Michael Weinstock, eds. *Techniques and Technologies in Morphogenetic*

Design. AD Architectural Design Vol. 76, 2 (London: John Wiley & Sons, 2004).
- Sanford Kwinter, "Landscapes of Change", ed. Umberto Boccioni, in Assemblage, No. 19, pp. 50-65, MIT Press, 1992
- Picon, Antoine "Architecture, Science, Technology and the Virtual Realm," in *Architecture and Sciences: Exchanging Metaphors*, ed. Antoine Picon + Alessandra Ponte PAPress, 2003, p. 292-313
- Lynn, Greg. "The Renewed Novelty of Symmetry." *Folds, Bodies & Blobs* and "The Cardiff Bay Opera House" in *Animate Form.*
- Manuel De Landa, "Uniformity and Variability. An Essay in The Philosophy of Matter," http://www.t0.or.at/delanda/
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- Holland, John. *Emergence: From Chaos to Order.* (Oxford: Oxford University Press, 1998)
- Burry, Jane, and Mark Burry. *The New Mathematics of Architecture*. (London: Thames & Hudson, 2010).

TOPIC 7 **FROM INDUSTRIAL UTOPIA TO DIGITAL E-TOPIAS**
POSTHUMANISM: CYBORGS, THE CITY OF BITS AND INTERACTIVE ENVIRONS

Supplemental Bibliography
- Armstrong, Rachel and Simone Ferracina. *Unconventional Computing: Design Methods for Adaptive Architecture*. Cambridge: ACADIA / Riverside Architectural Press, 2013.
- Boyer, Christine. "The Imaginary Real World of CyberCities." *CyberCities.* [Princeton: Princeton Architectural Press] 1996.
- Castells, Manuel. *The Informational City: Information Technology, Economic Restructuring and the Urban Regional Process.* Oxford: Basil Blackwell, 1989. And *The Net and the Self: Economy, Society, and Culture in the Information Age.* Oxford: Basil Blackwell, 1997.
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- Teyssot, Georges. "The Mutant Body of Architecture." in *Flesh* by Liz Diller and Ricardo Scofidio. (Princeton: Princeton Architectural Press: 1994).
- Vidler, Anthony. "Homes for Cyborgs." *The Architectural Uncanny.*
- Wendy Hui Kyong Chun. "Crisis, Crisis, Crisis; or, The Temporality of Networks. in *The Nonhuman Turn* (21st Century Studies) (Minnesota: University of Minnesota Press, 2015).
- Georges Canguilhem, "Machine and Organism," in *Incorporations.* Jonathan Crary and Sanford Kwinter, eds. (New York: Zone Books, 1992).
- Katherine Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature and Informatics* (Chicago & London: University of Chicago Press, 1999)

TOPIC 8 **PARAMETRICISM AND THE ALGORITHMIC MODEL:**
GENETIC ARCHITECTURES AND NON-STANDARD FORMS OF REPRODUCTION

Supplemental Bibliography
- Berman, Ila and Andrew Kudless. *FLUX: Architecture in a Parametric Landscape*. San Francisco/New York: ORO Editions: AR+D Publishing, 2015.
- Burry, Mark. *Scripting Cultures: Architectural Design and Programming*. (London: Wiley, 2011).
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- Leach, Neal, D. Turnbull and C. Williams, *Digital Tectonics.* (Chichester: Wiley, 2004).
- Leach, Neil, *Designing for a Digital World*. (London: Wiley, 2002).
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- Reas, Casey, and Chandler Williams *Form + Code: In Design Art, and Architecture.* (New York: Princeton Architectural Press, 2010).
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ENVIRONMENTAL, ECOLOGICAL AND BIOLOGICAL PARADIGMS:

TOPIC 9 **GEOLOGICS AND PERFORMATIVE SURFACES:**
FROM LANDFORM BUILDING AND LANDSCAPE URBANISM TO DROSSCAPES AND THE RECYCLING OF TERRITORIES

Supplementary Bibliography:

- Allen, Stan, and Marc McQuade, *Landform Building: Architecture's New Terrain*, Lars Muller Publisher, 2011
- Almy, D., [ed] *On Landscape Urbanism*. Volume 14, The Center for American Architecture and design, 2007
- Burns, Carol and Andrea Kahn. *Site Matters: Design Concepts, Histories, and Strategies.*
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TOPIC 10 **ECOLOGICS AND ARCHITECTURAL BIOMIMESIS**
03.23

Supplementary Bibliography

- Armstrong, Rachel, "Natural Computing: Operationalizing the Creativity of the Natural World*",* in *Paradigms in Computing,* David Gerber (Los Angeles: eVolo, 2014).
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- Daniel Ibañez & Nikos Katsikis eds. *New Geographies: Grounding Metabolism*. (Cambridge: Harvard GSD, 2014).
- Gissen, David. *Subnature: Architecture's Other Environments*
- Hensel, Michael and Achim Menges eds. *Versatility and Vicissitude: Performance in Morpho-Ecological Design.* AD Architectural Design Vol. 78, 2 (London: John Wiley & Sons, 2008).
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- Richard Wesley. *Robert Le Ricolais and the Search for Automorphic Structure.* in Megan Born, Helene Furjan and Lily Jencks *Dirt.* (Philadelphia: PennDesign and The MIT Press, 2012).
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- Wolfe, Cary. *What is Posthumanism?* (Minneapolis: University of Minnesota Press, 2010)
- Bennett, Jane *Vibrant Matter: A Political Ecology of Things.* (Durham and London: Duke University Press, 2010).

TOPIC 11 **FROM ENERGY TO ATMOSPHERE:**
03.30 **THE DISSOLUTION OF THE ARCHITECTONIC**

Readings

- Addington, Michelle. "Contingent Behaviors" in Sean Lally ed. *Energies: New Material Boundaries.*
- Lally, Sean. "Twelve Easy Pieces for the Piano." in *Energies: New Material Boundaries*. (London: Wiley, 2009).
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