

**A4701**

**NextGen: Innovation, Technology and Architecture**

Tues. 11:00 am – 1:00pm / Room 408 Avery

Instructor: Lise Anne Couture

**ABSTRACT**

Architecture, perhaps more than ever before, is today benefiting from the convergence of research and development of cutting edge technologies across a wide range of disciplines. From an explicitly design oriented perspective the NextGen seminar is an exploration and research of a varied cross-section of potential drivers of change and innovation with respect to the physical and spatial aspects architecture.

The seminar will involve research and exploration of diverse 'state of the art' and emerging technologies such as biodesign, self-assembling structures, sensor technologies, AI and IoT, smart and programmable materials, nanotechnology, 3D and 4D printing, virtual and augmented reality, robotics, mobility and autonomous vehicles, as well as cutting edge research in other relevant disciplines or areas of design. The class is interested in speculating from a design perspective on the aesthetic, cultural, spatial and formal implications that might result from the merging of architecture with these diverse cutting edge NextGen technological developments.

At the turn of the century the development of iron and steel frame structures liberated the plan and changed not only how one occupies but how also conceives of space while the development of large scale plate glass transformed not only building enclosure but also our understanding of the relationship between interiority and exteriority, privacy and publicity, profoundly impacting our contemporary urban environment. Today the development of sensor technologies and smart materials, AI, advancements in biomaterials, and other technological innovations continue to transform architecture and our experience of the built environment. The NextGen seminar is interested in exploring disruption, paradigm shifts and game changers that have the potential to drive innovation in architecture and design.

Students will research and explore emerging and cutting edge technologies that might influence our understanding and experience of form, space and the surrounding environment from a broad range of disciplines and areas of research. Through investigations of selected innovations or technologies the students will speculate upon potential architectural and urban applications and their possible impact.

Projects will involve individual or team research culminating in student presentations. As a final assignment students will 'design' a highly speculative conceptual architectural "scenario" that would incorporate one more of the researched technologies/processes/materials. Our task will be to speculate and to propose "What If". The generated proposals should be thoughtful and critical yet inventive, the intention of the course is to think out of the box, to push the envelop and to test the limits.

The class format will include lectures, discussions, student presentations, design reviews as well as talks or presentations by invited guest followed by discussions with the students

Class Requirements: attendance, assigned readings, short presentation of research assignment and preliminary project proposal, final presentation of a Speculative Design Scenario.

Past Guests have included:

Paola Antonelli: *Biodesign*

Senior Curator of Architecture and Design, and Director of R&D Museum of Modern Art

Greg Lynn: *Composite materials, Robotic buildings*  
Principal Greg Lynne FORM and Professor SupraStudio UCLA

Hod Lipson: *Digital Manufacturing; Artificial Intelligence*  
Director, Columbia University Creative Machines Lab

Skylar Tibbetts: *Self-assembling structures, 4D printing and programmable materials*  
Professor MIT Department of Architecture, Co-director of SJET Self-assembly Lab

Chuck Hoberman: *Transformable design and processes*  
Principal Chuck Hoberman Associates, professor Harvard GSD

David Benjamin: *AI and Biomaterials*  
Principal The Living, Director GSAPP Incubator

Mark Goulthorpe: *Reimagining fabrication and assembly*  
Professor MIT Architecture, Co-head of SMarchS Program and Principal of Decoi

David Kirkpatrick: *Techonomy and Urban Future*  
Techonomy, Founder and CEO