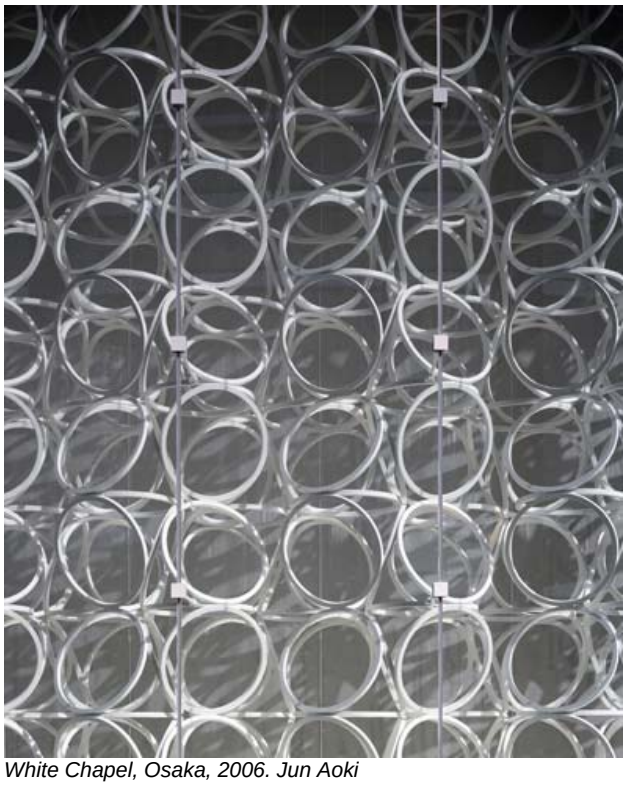

White Chapel, Osaka, 2006. Jun Aoki

To begin with the concrete physicality of matter rather than images allows for a change in the entire profile of three-dimensional art: from particular forms, to ways of ordering, to methods of production and, finally to perceptual relevance.

Robert Morris, "Notes on Sculpture Part 4" (1968) in Continuous Project Altered Daily: The writings of Robert Morris, p.68.

The sculpted depth of the unique 'ship-lap' spandrel panel creates a multitude of readings within the building's façade. The sill of the spandrel consists of a blue reflector which bounces ambient light from the sky up onto a second curved reflector. This ever-shifting ephemeral color accent captured in the façade is intended to enhance the viewer's experiential perception of light.

James Carpenter, on the curtain wall design for World Trade Center 7.

ARCH632-003

Spring 2008

Surfaces – Effects

THURS. 9:00-12:00

Professor: Cathrine Veikos, veikos@design.upenn.edu

The subtle and dynamic effects of the building surfaces of recent works by Herzog and de Meuron, Gigon/Guyer, Peter Zumthor, Jun Aoki, Sejima + Nishizawa/SANAA, and others are achieved through well-orchestrated details grounded in built reality. The perceptual effects of a building surface as a whole are directly related to the design of its elements of construction, its specific material and tectonic assemblies. Initial research by students will identify and examine the possibilities for organizing and structuring perception through the design of surfaces. Exhibition designs, works of installation art as well as recent building surfaces and enclosures will be considered in lectures that demonstrate the range of effects created by selected architects and artists.

The seminar will be conducted as a workshop where students will develop digital and material models towards the design of their own dynamic, environmentally responsive, surfaces. These proposals will be reviewed and discussed weekly. Recent advances in the design and fabrication of unitized curtain wall systems will foreground these discussions. Newly-developed materials, assemblies, coatings, films and treatments and un-traditional building materials will also be introduced. Building environmental systems and façades that have been designed as an integrated, synergetic system rather than as individual components will be highlighted. Accordingly, the seminar/workshop will not only address materials, but their integration into building systems. We will review the requirements and criteria for double-skin facades, exterior, interior and interstitial solar shading, natural (buoyancy-driven), forced (mechanically-driven) and mixed ventilation, as well as experimental proposals.

SCHEDULE

Jan 17	INTRODUCTION The Surface of Buildings - The Future of Building Design Blau, Eve, "Transparency and the Irreconcilable Contradictions of Modernity," Praxis: Journal of Writing and Building, *Expanding Surface,* Issue 9, 2007. Veikos, Cathrine, "The Sheer Opacity of Contemporary Enclosure" Special issue on Surface. JAE 57:2 (Nov. 2003) Leatherbarrow, David and Mohsen Mostafavi, Surface Architecture, (Cambridge,MA: MIT Press, 2002). Vidler, Anthony, "Transparency" in The Architectural Uncanny: Essays in the Modern Unhomely (Cambridge, MA: MIT Press,1992). 6:30 Upper Gallery *Conversations 2 : Surface + Depth*
Jan 24	*Tools you'll use*- Milling and Molds : Instruction in advanced material techniques
Jan 31	Surface/ Effects: Introduction to Installation Art 1968-1978. Bishop, Claire. Installation Art: A Critical History (New York: Routledge, 2005). Reiss, Julie. From Margin to Center: The Spaces of Installation Art (Cambridge, MA.: MIT Press, 1999). *Student Team Presentations: Acetate Studies/Material Studies*
Feb 7	Beyond the Curtain Wall Brownell, Blaine, Transmaterial: A Catalog of Materials that Redefine our Physical Environment (Princeton Architectural Press, 2006). Lupton, Ellen, Skin : Surface Substance + Design, (Princeton Architectural Press, 2002). Christian Schittich, ed., In Detail: Japan - Architects, Constructions, Ambiance, (Basel : Birkhäuser; 2002). Schittich Christian, ed., Building Skins: Concepts, Layers, Materials, (Basel: Birkhauser, 2001). *Tools you'll use*- Adhesives and Vacuum forming
Feb 14	Screens & Skins Moussavi, Farshid and Micheal Kubo. The Function of Ornament,(Actar, 2006). Hauer, Edwin.Continua: Architectural Screens and Walls, (Princeton Architectural Press, 2004). *Student presentations: Design Intentions, Discussions and Consultation of Work in Progress*
Feb 21	Material Invention: Lina Bo Bardi (1914-1992) Studies in Surface and Material Andrea Deplazes, ed., Constructing Architecture: Materials, Processes, Structures A Handbook (Basel: Birkhauser, 2005). Gunter Pfeifer, Antje M. Liebers and Per Brauneck. Exposed Concrete: Technology and Design, (Basel: Birkhauser, 2005). *Tools you'll use*- Components, Joints and fasteners
Feb 28	*Discussions and Consultation of Work in Progress (Drawings and Half–scale Mock-ups)*
Mar 6	Advanced Facades Unitized building systems: 2-sided systems, dynamic systems, multiple, heterogeneous units, perceptual layers, embedded technology. *Discussions and Consultation of Work in Progress*
	S p r i n g b r e a k
Mar 20	Review of Work with Consultants and Critics (Final Drawings and Half–scale Mock-ups)
Mar 27	Responsive Skins

	Physics of Moisture and Heat Transfer: materials, performance, durability and comfort Micheal Wigginton and Jude Harris, Intelligent Skins (London: Architectural Press, 2002). *Individual consultations of work in progress*
Apr 3	Experimental Skins: Nanotechnology and Bio-Tech Addington, Michelle and Daniel L. Schodek, Smart Materials and Technologies in Architecture, (Architectural Press, 2005).
Apr 10	*Discussions and Consultation of Work in Progress (Full Scale mock-ups)*
Apr 17	Individual consultations of work in progress
Apr 24	Final Installations - Gallery Show with Guests
May 2	Final Semester Documentation due

Course Requirements

1. GENERAL: Regular, on-time attendance to the seminar and active, prepared participation in the class discussion. Complete research proposal is expected by Jan 31. This must be presented in class with supportive visual and written material. Documentation of presentations must be submitted in writing and approved. The final development of the wall proposal, which will evolve over the semester through discussion and critique is a full-scale installation. An 11"x 17" printed document reflecting the semester's research and including images of the final installation must be submitted for grading before May 2. The submission should be of excellent quality with digitally composed text and images.

2. READINGS: All students are required to read each of the texts as outlined in the syllabus and to come prepared to engage in a critical discussion of the issues being addressed. The workshop will support local and remote collaborations and encourage cross-disciplinary work. Each student must commit to peer-to peer learning towards the development of the shared intellectual capital of the seminar group. Teamwork is encouraged.

3. PRESENTATIONS: It is expected that presentations will be a combination of visual material (digital images and models, web pages, digitally and manually- fabricated models, printed digital drawings/video) and prepared text.

Course Evaluation

1.Presentations & Discussions about work in progress

_Design Intentions (Material, Surface, Effects)	25%
_Research Proposal Documentation	15%
_Half scale mock-up and documentation	20%
_Final Full scale mock–up and documentation	25%

2. Readings, participation, contributions to the group, teamwork 15%

Requirements for Final Documentation

Install your full scale wall proposal and necessary printed documentation in review location (tba) before 8:30 on April 24, 2008.
Print supporting drawings of two typical panels at half-scale: Plan, section and elevation or sectional/exploded axonometric drawings should indicate joint details between panels in at least three of the following conditions:
1. ground 2.typical opening 3.typical joint 4.corner 5.sky
Print at least two renderings on the wall proposal *in the context of a building on a street*. Use these drawings to convey the desired effects of the wall, for example, in two different lighting conditions or from two distinct points of view. Include scale figures.

The final documentation must outline to process of the research and include a summary of the relevant research documentation and bibliography of sources consulted. All research and documentation must be presented in a concise digital presentation, highlighting the techniques, experiments and effects you found relevant to your own exploration. Note the condition of the surface as a mediation of

perceptual, psychological and/or spatial perceptions. Use analytical drawings, your photographs of study models and mid-review models, digital simulations and renderings to describe your wall proposal and the design development process. Include a photographic sequence that records your material explorations, testing and detail development.

Photograph the full scale mock-up and include with final submission. Submit all “1. General Requirements” listed above on a CD clearly labeled with your name(s), email, course number and date. Please use template provided and format to landscape 11” x 17” .doc or .pdf and print a hardcopy.