School of Architecture
University of Hawaii at Manoa
Fall Semester 2017
ARCH 744, Section 001

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Course Syllabus

1. No. & Title ARCH 744 Architecture Studio V: Comprehensive Design (CRN77010)

2. Course Description
Design and programming for a moderately complex building and site. Production of design development, and partial construction documents describing sustainable building assemblies and construction cost.

3. Prerequisites
ARCH 724 (Architecture Systems III: Quantitative Structural Analysis and Design), 725(Architecture Systems IV: Environmental Technology, Sustainability, and Analysis), and 742 (Architecture Studio III).

Students who have not completed any of these prerequisites before Fall 2015 should not take this studio.

4. Credits 6

5. Grading Letter grade "A"-"F"

6. Organization
(a) Class Format
2 Projects
-Research (group project of 2-3 students)
-Building design (group project of 2-4 students)
(b) Class Hours and Place
MW, 1:30-6:00pm, SOA Room 310
(c) Instructor Office Hours
MW6:00pm-7:00pm, with advance appointment only.

7. General Goals and Objectives of the Course
-Moderate Size and Complexity Building/Site Design
-Building/Site/Programming Analysis
-Full Integration of Sustainable, Material, Structural, and Life Safety Systems
-Design Development and Construction Documents

8. NAAB Student Performance Criteria (SPC) Covered
B.3. Codes and Regulations: Ability to design sites, facilities, and systems that are responsive to relevant codes and regulations, and include the principles of life-safety and accessibility standards.

B.4 Technical Documentation: Ability to make technically clear drawings, prepare outline specifications, and construct models illustrating and identifying the assembly of materials, systems, and components appropriate for a building design.

B.7 Building Envelope Systems and Assemblies: Understanding of the basic principles involved in the appropriate selection and application of building envelope systems relative to fundamental performance, aesthetics, moisture transfer, durability, and energy and material resources.
B.8 Building Materials and Assemblies: Understanding of the basic principles used in the appropriate selection of interior and exterior construction materials, finishes, products, components, and assemblies based on their inherent performance, including environmental impact and reuse.

C.3 Integrative Design: Ability to make design decisions within a complex architectural project while demonstrating broad integration and consideration of environmental stewardship, technical documentation, accessibility, site conditions, life safety, environmental systems, structural systems, and building envelope systems and assemblies.

10. Required Products
See Project statements.

11, Schedule (subject to changes, more detailed schedule will be orally announced in class)

Week# (Monday date)	Date (Day)	Activities (will be in the regular classroom if no other room # indicated)
01(08/21)	08/21(M)	Organization; Assign Project #1, Room 211
02(08/28)		
03(09/04)	09/04(M)	Labor Day, no class
	09/06(W)	Project #1 due/Presentation, Assign Project #2, Room 215
04(09/11)		
05(09/18)		
06(09/25)		
07(10/02)	10/04(W)	Project #2 Phase 1. Schematic design due, pin-up, Room 215
08(10/09)		
09(10/16)		
10(10/23)		
11(10/30)	10/30(M)	Project #2 Phase 2. Design development due, pin up, Room 215
12(11/06)		
13(11/13)		
14(11/20)	11/20(M)	Project #2 Phase 3. Partial Construction Documents due, pin-up, Room 215
15(11/27)		
16(12/04)	Time TBA	Project #2 Phase 4. Complete Project #2 due, Final Jury, place TBA

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12. Textbooks

(a) Design theories

Alexander, Christopher, Sara Ishikawa, & Murray Silverstein, et al. *A Pattern Language: Towns, Buildings, Construction*. New York: Oxford University Press, 1977.
Birksted, Jan, ed. *Relating Architecture to Landscape*. London : E&FN Spon ; New York : Routledge, 1999.
Harries, Karsten. "Thoughts on Non-Arbitrary Architecture." *Perspecta*, 1983 (20), pp. 235 - 50
Miao, Pu, ed. *Public Places in Asia Pacific Cities: Current Issues and Strategies*. Dordrecht, The Netherlands: Kluwer Academic Publishers, 2001.
Thiis-Evensen, Thomas. *Archetypes in Architecture*. Oslo: Scandinavian University Press, 1987.

(b) Building technology

Allen, Edward. *Architectural Detailing*. New York: John Wiley & Sons, Inc., 1993.
Allen, Edward. *Fundamentals of Building Construction, Materials and Methods, Second Edition*. New York: John Wiley & Sons, Inc., 1990.
Brown, G.Z. *Sun, Wind, and Light*. New York: John Wiley & Sons, 1985.
LaGro Jr., James A. *Site Analysis* (New York: John Wiley & Sons, 2001.
Zalewski, Waclaw. *Shaping Structures*. New York: John Wiley & Sons, 1998.

The construction manual series published by the German architectural journal *Detail*:
Schittich, Christian, et al. *Glass Construction Manual*. Basel: Birkhauser, 2007.
Hegger, Manfred, et al. *Construction Materials Manual*. Basel: Birkhauser, 2006.
Herzog, Thomas, et al. *Facade Construction Manual*. Basel: Birkhauser, 2004.

Herzog, Thomas, et al. *Timber Construction Manual*. Basel: Birkhauser, 2004.
Kind-Barkauskas, Friedbert, et al. *Concrete Construction Manual*. Basel: Birkhauser, 2002.
Schunck, Eberhard, et al. *Roof Construction Manual: Pitched Roofs*. Basel: Birkhauser, 2003.
Pfeifer, Gunter, et al. *Masonry Construction Manual*. Basel: Birkhauser, 2001.
And other volumes in this series.

(c) Reference books (Newer editions can be used)
Allen, Edward & Joseph Iano. *The Architect's Studio Companion, Second Edition*. New York: John Wiley & Sons, Inc., 1995.
City and County of Honolulu, *Revised Ordinances of Honolulu*. Chapter 16. Building Code, Chapters 21. Land Use Ordinance.
International Code Council. *International Building Code 2003*.Washington, D.C.: 2003.

13. Hardware/Software
(a) Recommended
None.
(b) Required
Autocad, *Sketch-up* and others.

14. Tools, Equipment, Material
None.

15. Activities/Format
See 11, Schedule.

16. Grading
(a) The final course grades will be determined from the following:

Project #1: Research	5%
Project #2: Design	
Phase 1: Programming and Schematic Design	20%
Phase 2: Design Development	20%
Phase 3: Partial Construction Documents	15%
Phase 4: Final Presentation	25%
Participation and Progress	15%
Total	100%

(b) Grading Criteria:
1. Your final grade is the accumulation of grades given to each stage (the percentage of each stage in the final grade will be announced in class). Grades are converted between the letter, 4-point, and 100-point systems following the formula below:

Letter	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
4-pt (Max. 4)	4.0	3.7	3.3	3.0	2.7	2.3	2.0	1.7	1.3	1.0	0.7	0.0
Semester (Max. 100)	>/=94	<94	<84	<76	<69	<59	<51	<44	<34	<26	<19	<9

Poor attendance to the classes will reduce your cumulated grade as specified below.

2. Late work without acceptable excuses will receive a "0". All work due at the beginning of the due date. An excuse

is acceptable only when it is due to an unexpected and critical event, documented by an official certificate (not your mom's note), and approved by this instructor.

3. Attendance to every class meeting is mandatory. However each student is allowed two absences in emergency situations (such as traffic accidents and medical emergencies). Every absence beyond the allowance will reduce your semester grade **regardless of the reason.**

4. Three tardies or early withdrawals will be counted as one absence regardless of the reason.

5. You are responsible to ask for and sign the attendance sheet either at the beginning or the end (if you are late) of each class. Without the signature you are marked as absent, no later explanation will be accepted.

6. Deadlines and other requirements are applicable to every student disregarding whether or not he/she attends the class in which these requirements are announced. Students who miss a class are responsible to find out by themselves what handouts and instructions have been given during that missed class.

7. The particular grade a student receives is based on the following general principles:
(1) Students having finished all required items on time will receive at least C′s.
(2) Among the above students, those whose works display functional, technological, formal and presentation qualities of a satisfactory but conventional level will have at least B′s.
(3) Among the above students whose works show creative solutions will be awarded A′s.

17. UHM/SCHOOL OF ARCHITECTURE POLICIES AND PROCEDURES:
(a) The course will follow current University of Hawaii at Manoa and School of Architecture Policies and Procedures and all students are expected to have read, familiar with, and abide by these Policies and Procedures.
(b) Assumption of Risk and Release Form: All students enrolled in this course are required to complete the School of Architecture Assumption of Risk, Release, and Indemnity Agreement. Enrollment in this course will be accepted as your affirmation that you have complied with the requirement.

18. ATTENDANCE & LATENESS:
See 16. Grading (b).

19. MISCELLANEOUS:

Unique Themes for This Section

- Because this studio focuses on the comprehensive nature of building design, as is practiced in the "real world," students must be aware that aesthetic design of forms counts a smaller portion of the class time, as compared to the studios they took at UH before. In addition to the formal design, students are asked to work on many new topics such as the social, functional and technical aspects of a building. In particular, the technical design should go beyond merely making the formal scheme buildable, it should use technical measures to enhance the functional and formal design concepts. Considering the limit of time, this studio asks the students to only design the life-safety, structural, rain water drainage, sustainable HVAC systems, and major building materials. The construction document will only involve two wall sections plus a few details.
- The inclusion of the new issues in teaching mentioned above does not lower our expectation on innovative design. In addition to fulfilling the general aesthetic and functional requirements, the formal design part of this studio has its own unique pursuits:
  -- Understanding the theory and design patterns of existential meanings of geometric forms and natural elements. Apply these patterns to the creation of public spaces with appropriate emotions.
  -- Pairing indoor and outdoor spaces to create a more holistic environment for each major building function.

Teaching Techniques
1. This section uses a design process that focuses on a central concept from schematic design to detailing. Once the

central concept is decided, any new idea (no matter it is about a room or a door knob) must support the central concept. Therefore, new concepts will be examined rigorously. Please do not confuse this with disrespecting your creativity.
2. This "central concept" is not a verbal or written statement about "good" architecture. It is a particular, physical, and 3-D organization. Therefore, you should only use models or drawings to communicate with your instructor about your central concept.
3. You should never stay on one aspect of your design for too long, such as keep working on the plan or on certain form. Keep hopping among various aspects of the design to ensure that you are working comprehensively.
4. This section emphasizes the integration of different building systems. Building structure, environmental control devices and other utilitarian systems should be simultaneously used as functional and formal devices.
5. This section encourages innovations beyond merely workable solutions similar to those in reality.

Class Rules
1. This course is not an independent study. And your studio project does not equal to your personal creation like the sculpture you make in your home. Rather, the studio project is an instructional vehicle through which your instructor helps you to learn. Therefore, you are responsible to listen, respond to, and follow (when you cannot convincingly defend your view) your instructor's critiques. You are encouraged to debate with your instructor in a rational manner. "I like it" is not acceptable as a rational and convincing argument.

2. Architecture is a physical thing, therefore you are required to use drawings and models to communicate with your instructor about your design. Each drawing and model must show the entire project with enough details. Merely talking or doodle-like sketches are not acceptable because your instructor is not capable to "guess" your mind. Be prepared that you may have to redo the drawings and models if the desk critique deems necessary, please do not confuse this with disrespecting your physical labor.

3. You are responsible to produce revised drawings or models between two classes, but not in the next class. Students who do not have any new work done at the beginning of a class will not have another desk critique in that class.

4. Part of the class requirements is given orally rather than in handouts. You are responsible to take notes during the instructor's lectures, announcements and desk critiques. From time to time we may need to review notes of previous desk comments.

5. You are required to keep in the studio everything related to the class. Keep all previous sketches, working models, etc. to the end of the semester.

6. The use of computer is encouraged in producing presentation drawings. But during the schematic design phase no CAD drawings (except for Form-Z or similar 3-D modeling software) should be used, only free-hand sketches and working models. Also, students who decide to use computers should assume all responsibilities to honor the deadlines (including the responsibility to secure alternative access to equipment and material when the SOA computer lab fails to provide these).

7. During the making of models and other physical objects required by the class, if you are not sure how to handle certain equipment and material, stop and look for professional help. This instructor never requires you to do any work which may harm your body. When you are in the Model Shop, follow all instructions by the shop supervisor, especially regarding trash disposal.

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Project #1: Research for a Wetland Exhibition/Recreational Facility, Inter-city Park, Kunshan, Jiangsu Province, China

1. Background

Located west of Shanghai, Kunshan city occupies a land area of near 928 square kilometers. 23% of it is water areas. The region has cold winters (sub zero) and hot summers (35°C), with an annual average temperature of 17.6°C. The prevailing wind comes from southeast during summers and northwest during winters. Having a population of near 1,640,000 people, the historical city has seen a rapid economic and urban growth since 1990s, and has become a major manufacturing center of the region. The developer is a part of the local government but run as a corporation. The company takes charge of the construction and maintenance of public housing and public facilities in the City.

2. Site

The Inter-city Park is now named as Xingxi Park. An Autocad site map of the Park (each measuring unit in this drawing equals to 1 meter) before landscape design and a PowerPoint presentation on the initial landscape planning analysis are available for downloading. The Park is also visible from Google Map, but double check if the street grids are overlapped correctly when you use the satellite view.

The west end of Kunshan borders on Lake Yangcheng. In addition to be the largest lake in the vicinity of Shanghai, the lake is also well known for its crabs. The natural view and delicacy attract large amount of visitors from Shanghai, especially during the three months of the fall. Boats containing sea food restaurants densely occupy the shoreline, resulting in a shabby commercial environment. Most of the lands along the lakeshore have become high-end, gated single-family communities, except for a few public parks (our site is one of them) which will serve as the venues of one-day recreational activities, with the Lake as the central attraction.

As part of the nation-wide construction of high-speed railways, two inter-city train lines have been created at the southern boundary of Lake Yangcheng mention above. Flanked by the two railway lines, a strip of 6-kilometer-long land stretches between the Lake Yangcheng Railway Station and the lakeshore. The City intends to build a botanical garden on the linear land which has many water areas. The client will be the actual developer and operator. The visitors of the park will be Shanghai vacationers who take the trains and local residents from the central city of Kunshan via either buses or private cars. For people not driving, it is intended that they travel from the train station to the lakeshore by rented bicycles, horse carriages or boats.

3. Developer's Intention

Sports or other outdoor activities do not attract as many Chinese urban residents, especially of the middle-aged group, as in the US. After arriving in the countryside, many Chinese tourists prefer card-playing, eating and talking, with some sightseeing, as their chief vacation activities. Considering the hot summers and cold winters, the client suggests that the park should not be planned as a conventional botanical garden and this building should not be narrowly viewed as a museum. Instead, we should consider the facility as a multi-functional place to allow people to take a rest while being entertained /educated by the exhibits. A creative interpretation of the programming is the key to the design success. In addition, there will be no curating/research/exhibit-making functions and temporary exhibitions in this project. Exhibits will be produced in another location and simply mounted for a long-term exhibition here.

3. Work to Be Performed

Your research report must be a concise summary of the principles with key dimensions. All material must be fully digested and summarized with your own words and diagrams to fit the needs of our studio. No long quotations or Xeroxed pages should be used. Most findings should be illustrated by diagrams. All findings should show the page numbers and other source information.

Each student will select one of the four topics to conduct research:
(1) Building precedents
A page-by-page search of wetland centers, museums or any similar facilities in architectural journals of the last 10 years, the following journals are recommended:
--*Architectural Record*
--*Architectural Review*
--*Japan Architects* and other journals
Present all cases you find. Your presentation must include plans, sections, photos and one short paragraph on the central concept and exhibition theme of the design.

(2) Museum building, public resting facility, and wetland museums

a) Find typical spatial organizations (by bubble diagrams), technical requirements, and minimum sizes for all basic functions and furniture/equipment (no need for the kitchen) of museums and public resting facilities.

b) Find unique ways to exhibit on wetland, such as its plants, animals, geology, etc.

(3) Building codes
In lieu of Chinese building codes, use IBC for egress, universal accessibility and other requirements. Concentrate on those which related to our project.

(4) Chinese contemporary culture
Describe the social, economic, cultural and behavioral characteristics of Chinese middle-income urban residents, the potential users of our building.

(5) Tradition of Chinese architecture and landscape
Summarize the basic formal characteristics of Chinese traditional architecture, garden, and town (especially the canal towns). Describe the characteristics of the rural land and water area in the region.

4. Final Products
(1) A PowerPoint presentation showing major findings.

(2) An 8.5X11" booklet containing the complete report of your research.

(3) A CD containing a copy of all materials above.

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Project #2: Architectural Design for a Wetland Exhibition/ Recreational Facility, Inter-city Park, Kunshan, Jiangsu Province, China

1. Project Outline
This project is a continuation of Project #1. Each team will contain 2-4 voluntary members. Team composition cannot be changed once formed. Members will earn the same grade. Each team will produce a building/site design as informed by the research.

2. Developer's Suggested Program
Total building area: 1,850 square meters, a 10% variation is permitted. "Building area" means all areas which are covered by a roof/floor supported by walls or columns. Areas covered by a cantilevered roof/floor are counted as 50%.

The building should include the following areas/rooms:
Lobby with reception counter (including a ticket counter)
Administration office for one director
Staff changing/lunch/meeting room with lockers
Janitor room for cleaning/maintenance tools and for temporary storing of small exhibits to be replaced.
2 parking spaces for delivery

Exhibition spaces, including viewing platforms, bridges, etc.
Resting/recreational spaces, with vending machines in resting spaces
Café
Gift shop
The above functional areas may be mingled or separated, indoor or outdoor, based on your design idea.

A/V room for 60 seats, may be used for meetings/lectures for the public when the museum is closed.
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Public restrooms

It is encouraged to allow each major room to be connected with some kind of outdoor spaces.

3. Work to Be Performed (see Schedule in the Syllabus for due time of each phase)
Phase 1. Programming and Schematic Design
Using research reports from the last project and additional research of your own:
(1) Propose a site plan, select a location in the Park for the building and show how the building will be connected to the visitors' different transportation routes.
(2) Develop at least one schematic design for the project.
(3) Parallel to the design process, generate a program, i.e., a list of rooms (or areas), their sizes and special requirements for your intended building.
(4) Use a diagram to ensure that assumed construction type, max. floor area and height of each Building Area, egress, max. travel distance and others are all following the building code.
Required products for this phase:

- A written program,
- A full set of schematic drawings including plans, sections and a site plan. Scale 1:500 (site plan 1:1000)

- A 3-D working model.
- One diagram illustrating life safety issues.
- Other illustrations as you wish.

Phase 2. Design Development
Based on the above schematic design and its revisions following instructor's recommendation, produce a package of design development documents for the project, which should include the following designs:

(1) Finalized architectural design. You need to complete the architectural design to incorporate all design development information.
Required products for this phase:

- Floor plans, roof plan, site plan, min. 4 elevations (may be replaced by near-elevation views of a 3-D building model) and min. 2 sections cut at locations approved by the instructor. All drawings are of 1:100 scale except for the site plan is 1:500.

The drawings must be of professional quality. For example, show proper line weights and other graphic conventions. All lines must be legible seen from 5 ft. away. CAD drawings are required. Outdoor spaces must show the 4 textures to be explained in class. Plans should indicate floor heights (elevations). First floor plan must show site conditions near the buildings. Consult with a textbook on design development drawings for complete requirements.

(2) Initial designs for other building systems
a) Structural system. You need to produce a complete structural layout, specify the types and sizes of all major structural members, and incorporate the structure with the building form.
Required products for this phase:

- An outline of specifications that lists the hierarchy of structural members. Each entry must contain the 4 parts to be explained in class.
- A set of isometric views (with labels for typical structural members and nature of connection in typical bays) of a 3-D framing model.
- In the previously mentioned architectural drawings, all structural members must be shown in their real sizes.

b) Building materials. You need to select materials for all major building components of your design. Plus, you are required to use at least 2-3 relatively new building products and materials. You will do library and web research to find manufacturers' information.
Required products for this phase:

- In the previously mentioned architectural drawings, label all major materials for elevations, roofs, ceilings and floors.
- In previously mentioned outline of specifications, list the major materials for walls, roofs, ceilings and floors. Each entry must contain the 4 parts to be explained in class.
- Provide manufacturers' information sheets (Xeroxed copies are fine) about new products and materials.

c) Weather control system. You need to design passive weather control devices and coordinate these systems with the building form.
Required products for this phase:

- In the previously mentioned architectural drawings, show architectural treatment for passive heating and cooling, such as shading devices, window openings to allow cross ventilation, and locations for the outdoor units of the active AC system.

d) Plumbing systems. You need to design the rain water drainage system, especially its impact on building elevations. Required products for this phase:

- In the previously mentioned architectural drawings, show rain water drainage design in plans and downspouts etc. in elevations.

Phase 3. Partial Construction Documents Based on the global consideration of building systems above, design

wall sections cut at the critical locations of the building, as approved by the instructor. Students must investigate into new building materials and systems. For unique building products you must supply manufacturers' information sheets. In addition, at least three areas in the wall sections need to be blow up to show details. It is recommended that students use Sketch-up drawings (in isometric views) to start designing.

Required products for this phase:

- Two wall sections of 1:10 or 1"=1'-0" scale. If necessary deemed by the instructor, you may need to also supply a partial plan of the same scale.
- Min. 3 details of large scales (such as half or full scale) for each wall section.
- Manufacturers' suggested detail drawings (Xeroxed copies are fine) for new products and materials, on which you base your design.

Phase 4. Final Presentation

Required products for this phase:

- All material listed for Phases 2 and 3, but refined.
- One 1:200 or 1/16"=1'-0" scale model of professional quality. The model must include partial streets and neighboring site features around your project. All parts should be permanently glued except for a few you intend to remove to show the inside of building. The base must be of plywood.
- One detail models of professional quality, scale TBA for each case. The detail normally will be the critical part of your wall section. The model should have major materials labelled.
- At least 5 photos for the building model (or 5 artistic renderings of the building) and 3 photos for the detail model, photos should be at least A4 size and 300 dpi.
- One short text and a few sketches on your design concepts and process.
- Other material you deem necessary.

All material listed above should be submitted in both of the two forms below:

(a) Printed on papers of the same size and orientation. The layout should be of professional quality. Make sure that you can display all papers vertically on walls of the particular classroom, otherwise you need to mount the papers on foamcore boards.

(b) A CD/DVD, information must be in JPG or PDF format which fits the regular computer screen ratio (i.e, not too wide).

You may use PowerPoint to supplement the above if desired.

3. Due Time and Place, and Grading

See Syllabus for due dates and places, all material is due at the beginning of the class at the classroom or jury room. Please read the "Grading Criteria" in the syllabus. In addition, missing any item required in "Phase 4. Final Presentation" above will result a "D" grade for this project.