



**THE CATHOLIC UNIVERSITY OF AMERICA
SCHOOL OF ARCHITECTURE & PLANNING**

**Arch 402/503 Comprehensive Building Design Studio (CBDS)
Spring 2009**

*Undergraduate and Graduate Syllabus
6 credit hours, Graduate Studio
Monday, Wednesday, Friday
2:10 pm – 6:00 pm*

**Arch 407/519 Comprehensive Building Design Studio Supplement
Spring 2009**

*Undergraduate and Graduate Syllabus
3 credit hours, Koubek Auditorium
Monday, Wednesday, Friday
1:10 pm – 2:00 pm*

Instructor contact information

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Course Description

Arch 402/503 Comprehensive Building Design Studio

The Comprehensive Building Design Studio (CBDS) explores conceptual and technical aspects of architectural form and the integration of the various building assemblies and systems. During the CBDS, each student shall bring the knowledge, skills, and understanding gained from all previous coursework and experiences to the development of a conceptually coherent, comprehensive, integrative, and buildable architectural design proposal. Studio work will include schematics: integrating major building systems and sustainable strategies with design at a conceptual level shown in conceptual drawings of structural, mechanical, passive environmental and lighting systems; design development: using large scale models and drawings to test initial ideas and the integration of these ideas; studying materials and details of assembly including vertical surfaces relative to framing systems, wall sections and details of assembly; and presentation: with final models and drawings of site plan, plans, sections, and elevations.

The course organization is modeled on that of an architectural practice and therefore come with *professional expectations for performance*.

Arch 407/519 Comprehensive Studio Supplement

The Comprehensive Studio Supplement (CSS) is the research component of the CBDS. Although listed separately, both courses are intended to be fully integrated with each other. Topics introduced and researched during the CSS are to be applied, tested and developed throughout the CBDS. During the CSS, topics will be presented to the students in various forms from lectures, field trips and workshops.

Instructional Methods:

| | |
|-------------------|---|
| Arch 407/519 CSS | Lecture / Seminar / Research (lectures, workshops, field trips) |
| Arch 402/503 CBDS | Design Studio |

Required Readings / Books

The following books can be purchased online through www.amazon.com.

Allen, Edward, *The Architect's Studio Companion*, 4th edition, John Wiley & Sons, New York.

Ching, Francis D. K., *Building Construction Illustrated*, 3th edition, Van Nostrand, New York.

Ching, Francis D. K., *Building Codes Illustrated*, 2nd edition, John Wiley & Sons, New York.

International Building Code (IBC), 2006 IBC

Wiggins, *A Manual of Construction Documentation*

Allen, Edward, *Architectural Detailing*, 2nd edition, John Wiley & Sons, New York.

Herzog, Thomas, *Façade Construction Manual*, Birkhauser-Basel.

Brown, G. Z. and Dekay, Mark, *Sun, Wind and Light*, John Wiley & Sons, New York.

Professor Yatt's book, *Expansion: Seeking Options*, can be purchased through Lulu.com at <http://www.lulu.com/content/1148083>

Other code books are available at the Architecture & Engineering library for your use.

You may also access the following sites:

www.buildinggreen.com username: cdbscua password: rally

<http://www.greenshape.com/resources.html>

Reading materials / Web Materials with full citations

Arch 402/503 CBDS will have its own course web-site where students may find relevant information including readings, project and site information, syllabus and schedules.

Course Goals

The CBDS semester may be one of the most intensive and rigorous architectural education. It induces students to move beyond conceptual and schematic design and to consider the interaction of the various components of the building into one synthetic whole. The student should be cognizant of means and methods of construction as well as basic materials properties and interactions. The end product will be a well developed and buildable design. In addition, students will be encouraged to question and innovate on existing means of architectural documentation and building constructions.

This studio focuses on the integration and development of building systems with the spatial, theoretical, and contextual ideas of architecture. Work focuses around a semester long team project that includes development of environmental systems and structural systems and details for a complex project. Students will be encouraged to develop their technical competence within a framework that encompasses social and environmental issues related to design.

Management, communication issues and collaborative skills will be explored on both a personal and professional level in order to prepare students for the self-motivated approach required to carry out the final project as well and their professional career beyond the university. Innovation and integration in architectural design will be stressed, with respect to structure, building envelope, environmental systems, and site planning.

By the end of this course, students should understand that design continues even at the level of the detail and that beauty can be found in the technological systems that are needed in buildings today. The students should also understand the importance of sustainable design through all stages of the design process.

Goals for Student Learning

At the conclusion of the semester, each student should be able to demonstrate an:

- Ability to produce an architecture project informed by a comprehensive program, from schematic design through the detailed development of programmatic spaces, structural and environmental systems, life-safety provisions, wall sections and building assemblies, as may be appropriate; and to assess the completed project with respect to the program's design criteria.
- Ability to assess, select, configure and detail as an integral part of the design appropriate combinations of building materials, components and assemblies to satisfy the requirements of the building program.
- Understanding of the principals, conventions, standard, applications and restriction pertaining to the manufacture and use of construction materials, components and assemblies.
- Ability to assess, select and integrate structural systems, environmental systems, life safety systems, building envelope systems and building service systems into building design as described by the national Architectural Accrediting Board (NAAB) Performance Criteria.

Professional Standards Addressed

The following criteria are taken directly from the NAAB Performance Criteria. All students will need to demonstrate an:

- **Understanding** (means the assimilation and comprehension of information without necessarily being able to see its full implication)
- **Ability** (means the skill in using specific information to accomplish a task, in correctly selecting the appropriate information, and in applying it to the solution of a specific problem)

The following criteria will be used as a template for the evaluation of each student's performance during the CBDS studio.

1. Speaking and Writing Skills

Ability to read, write, listen, and speak effectively

2. Critical Thinking Skills

Ability to raise clear and precise questions, use abstract ideas to interpret information, consider diverse points of view, reach well-reasoned conclusions, and test them against relevant criteria and standards

3. Graphics Skills

Ability to use appropriate representational media, including freehand drawing and computer technology, to convey essential formal elements at each stage of the programming and design process

4. Research Skills

Ability to gather, assess, record, and apply relevant information in architectural coursework.

5. Formal Ordering Systems

Understanding of the fundamentals of visual perception and the principles and systems of order that inform two- and three-dimensional design, architectural composition, and urban design

6. Fundamental Design Skills

Ability to use basic architectural principles in the design of buildings, interior spaces, and sites

7. Collaborative Skills

Ability to recognize the varied talent found in inter-disciplinary design project teams in professional practice and work in collaboration with other students as members of a design team

8. Western Traditions

Understanding of the Western architectural canons and traditions in architecture, landscape and urban design, as well as the climatic, technological, socioeconomic, and other cultural factors that have shaped and sustained them

9. Non-Western Traditions

Understanding of parallel and divergent canons and traditions of architecture and urban design in the non-Western world

10. National and Regional Traditions

Understanding of national traditions and the local regional heritage in architecture, landscape design and urban design, including the vernacular tradition

11. Use of Precedents

Ability to incorporate relevant precedents into architecture and urban design projects

12. Human Behavior

Understanding of the theories and methods of inquiry that seek to clarify the relationship between human behavior and the physical environment

13. Human Diversity

Understanding of the diverse needs, values, behavioral norms, physical ability, and social and spatial patterns that characterize different cultures and individuals and the implication of this diversity for the societal roles and responsibilities of architects

14. Accessibility

Ability to design both site and building to accommodate individuals with varying physical abilities

15. Sustainable Design

Understanding of the principles of sustainability in making architecture and urban design decisions that conserve natural and built resources, including culturally important buildings and sites, and in the creation of healthful buildings and communities

16. Program Preparation

Ability to prepare a comprehensive program for an architectural project, including assessment of client and user needs, a critical review of appropriate precedents, an inventory of space and equipment requirements, an analysis of site conditions, a review of the relevant laws and standards and assessment of their implication for the project, and a definition of site selection and design assessment criteria

17. Site Conditions

Ability to respond to natural and built site characteristics in the development of a program and the design of a project

18. Structural Systems

Understanding of principles of structural behavior in withstanding gravity and lateral forces and the evolution, range, and appropriate application of contemporary structural systems

19. Environmental Systems

Understanding of the basic principles and appropriate application and performance of environmental systems, including acoustical, lighting, and climate modification systems, and energy use, integrated with the building envelope

20. Life Safety

Understanding of the basic principles of life-safety systems with an emphasis on egress

21. Building Envelope Systems

Understanding of the basic principles and appropriate application and performance of building envelope materials and assemblies

22. Building Service Systems

Understanding of the basic principles and appropriate application and performance of plumbing, electrical, vertical transportation, communication, security, and fire protection systems

23. Building Systems Integration

Ability to assess, select, and conceptually integrate structural systems, building envelope systems, environmental systems, life-safety systems, and building service systems into building design

24. Building Materials and Assemblies

Understanding of the basic principles and appropriate application and performance of construction materials, products, components, and assemblies, including their environmental impact and reuse

25. Construction Cost Control

Understanding of the fundamentals of building cost, life-cycle cost, and construction estimating

26. Technical Documentation

Ability to make technically precise drawings and write outline specifications for a proposed design

27. Client Role in Architecture

Understanding of the responsibility of the architect to elicit, understand, and resolve the needs of the client, owner, and user

28. Comprehensive Design

Ability to produce a comprehensive architectural project based on a building program and site that includes development of programmed spaces demonstrating an understanding of structural and environmental systems, building envelope systems, life-safety provisions, wall sections and building assemblies and the principles of sustainability

29. Architect's Administrative Roles

Understanding of obtaining commissions and negotiating contracts, managing personnel and selecting consultants, recommending project delivery methods, and forms of service contracts

30. Architectural Practice

Understanding of the basic principles and legal aspects of practice organization, financial management, business planning, time and project management, risk mitigation, and mediation and arbitration as well as an understanding of trends that affect practice, such as globalization, outsourcing, project delivery, expanding practice settings, diversity, and others

31. Professional Development

Understanding of the role of internship in obtaining licensure and registration and the mutual rights and responsibilities of interns and employers

32. Leadership

Understanding of the need for architects to provide leadership in the building design and construction process and on issues of growth, development, and aesthetics in their communities

33. Legal Responsibilities

Understanding of the architect's responsibility as determined by registration law, building codes and regulations, professional service contracts, zoning and subdivision ordinances, environmental regulation, historic preservation laws, and accessibility laws

34. Ethics and Professional Judgment

Understanding of the ethical issues involved in the formation of professional judgment in architectural design and practice.

Project Requirements

See attached for Arch 402/503: Comprehensive Building Design Studio Course Project Description for additional information.

Expectations and policies

Academic honesty

Academic honesty is one of the foundations of the educational mission and Catholic commitment of this university. Academic dishonesty, including such practices as cheating, plagiarism and fabrication, undermines the learning experience, and, as it involves fraud and deceit, is corrosive of the intellectual principles and is inconsistent with the ethical standards of this university. Academic dishonesty damages the sense of trust and community among students, faculty and administrators.

The policy sets forth the standards of honesty which student members of our academic community are expected to follow. The faculty is also bound to adhere to the strictest standards of academic honesty. All members of the academic community have an obligation to familiarize themselves with these standards and to conduct themselves in accordance with both their letter and their spirit. Individual schools in the university have committed themselves to implementing these standards and to educating faculty, staff and students on the importance of academic honesty and on the application of these standards in a variety of academic settings.

For additional information on the University's Academic Honesty policies, please refer to <http://policies.cua.edu/academicundergrad/integrityfull.cfm#I> for additional information.

Other Policies or Expectations.

Attendance and punctuality during studio course times and reviews are CRITICAL and will be included as part student assessments. Instructors will take note of a student's participation during course lectures, desk critiques, reviews and presentations. A student's level of "professionalism" and "collaborative" engagement with his/her peers will be expected and evaluated closely throughout the semester.

IF A STUDENT WILL BE LATE OR ABSENT FROM STUDIO, THEY MUST NOTIFY THE INSTRUCTORS / COORDINATOR PRIOR TO THE DATE OF ABSENCE.

Student Assessment:

Since the CBDS and CSS are fully integrated, students will be evaluated jointly for both classes. However, the individual grade given for the assignments/notebooks as well as the grades on the oral defense will be used to determine the grade for the supplement course. Evaluation of students for the studio will be calculated based on a combination of a "firm" grade and an "individual" grade. Methods of evaluation will include formal presentation, design reviews, peer evaluations, faculty assessments, submittals, oral defenses and exams.

Students will receive both Group/Firm grades and Individual grades with comments after each of the Graded Reviews.

Evaluation for CBDS:

Group / Firm Jury Grades

25%

- Reviews 1-4 and Final Presentation
- Juror's Evaluation
- Instructor's Evaluation

Individual Grade

75%

- Peer Evaluations
 - 1-4 and Final Presentation
 - Students will have the opportunity to evaluate / comment on the performance of their peers as a means of providing feedback to the instructors.
- Grading Benchmarks (coincide with Review Dates)
 - 1-4 and Final Presentation
 - The CBDS faculty will assess student performance using National Architectural Accreditation Board's, "Conditions for Accreditation." as a template for the evaluation of each student's performance during the studio. In addition, studio faculty will assess students on their level of engagement / class participation, ability to collaborate effectively with their peers, attendance, craft, respect for their work.

Evaluation for CSS:

For assignments, students will receive individual grades. These evaluations will be used in order to inform the instructor's student assessments, and as stated before, to determine the grade for the supplement.

Students will also be required to keep a notebook / sketchbook for Arch 402 Comprehensive Studio Supplement documenting class lectures, workshops and field trips. CSS Notebooks / Sketchbooks will be periodically collected, evaluated and incorporated into the grading calculation for the supplement.

The Oral Defense will be evaluated by visiting practitioners, consultants and faculty. Its format will be an oral question and defense period. Students will make final design submittals prior to the defense to the panels so they can be evaluated in advance. Students will be evaluated on the final work product and their ability to defend it, explain it, or correct it, in dialogue with the panel.

Individual student assessments will be tabulated using the following percentages and with grades received in the following categories.

University Grades:

A 4.0 Excellent

The student has demonstrated a full understanding of the subject matter, has capacity to analyze, has demonstrated critical thinking, shows evidence of creative thinking, familiarity with the work and previous work in area, highly developed communication and presentation skills. The work is of outstanding quality according to the criteria established for evaluation.

A- 3.7

B+ 3.3

B 3.0 Satisfactory

The student has shown good comprehension of subject matter, evidence of critical and creative thought, familiarity with the work and previous work in subject area, competence in communication and presentation skills, but none of the above to the degree found in A category. The work is of very good quality according to evaluation criteria.

B- 2.70

C 2.0 Passing but Marginal

The student has demonstrated some understanding of subject matter, can assimilate and communicate basic aspects of the subject matter. The work is of satisfactory or adequate quality according to evaluation criteria.

F 0.0 Failing

The student has inadequate understanding of subject matter, failed to complete course requirements, shown no demonstration of critical thought, communication skills very poor. The work is clearly of unacceptable quality according to the evaluation criteria.

I Incomplete

Grade will revert to an F if not removed by mid-semester of succeeding term, whether or not student continues in residence

W Withdrawal

APRIL 1, 2009 IS THE LAST DAY TO WITHDRAW FROM STUDIO

The University grading system is available at <http://policies.cua.edu/academicgrad//gradesfull.cfm#iii> for graduate students. Reports of grades in courses are available at the end of each term on <http://cardinalstation.cua.edu>.

Course Schedule

See attached for Arch 402/503: Comprehensive Building Design Studio Course Schedule for additional information.

Bibliography

General

Allen, Edward and Joseph Iano, *The Architect's Studio Companion*, John Wiley & Sons, New York
Yatt, Barry D., *Parti Planning: A Guide to Pre-Design Analysis*, Lulu Press, 2006 (can be ordered direct, from <http://www.lulu.com/content/139912>).
AIA's "Architect's Handbook of Professional Practice", Student Edition (http://www.amazon.com/Architects-Handbook-Professional-Practice-Student/dp/0471176729/ref=sr_1_1?ie=UTF8&s=books&qid=1199806060&sr=1-1)

Pre-Design: Regulations

Ching, Francis D. K., *Building Codes Illustrated*, John Wiley & Sons, New York.
Yatt, Barry D., *Cracking the Codes: An Architects Guide to Building Regulations*, John Wiley & Sons, New York, 1998.
International Building Code, 2000 (DC has not yet adopted more recent editions).
International Plumbing Code, 2000
International Structural Code, 2000
International Mechanical Code, 2000
International Electrical Code, 2000 or National Electrical Code 1996
International Fire Code, 2000
International Energy Code, 2000

Pre-Design: Site Design

White, Edward T. *Site Analysis: Diagramming Information for Architectural Design*. Architectural Media, Ltd., Tallahassee, 1983
Harris, Charles W., and Nicholas T. Dines, *Time Saver Standards for Landscape Architects*, 2nd Edition.
Russ, Thomas H., *Site Planning and Design Handbook*.
LaGro Jr., James A., *Site Analysis: Linking Program and Concept in Land Planning and Design*.

Pre-Design: Programming

Pena, William M. and Steven A. Parshall, *Problem Seeking*, 4th Edition, John Wiley & Sons, New York, 2001
White, Edward T. *Space Adjacency Analysis: Diagramming Information for Architectural Design*. Architectural Media, Ltd., Tallahassee, 1986.

Formal Design

Semper, Gottfried, Chapter V: "The Four Elements" from *The Four Elements of Architecture and other Writings*, translated by Malgrave and Herrmann, New York: Cambridge University Press, 1989
Etlin, Richard, Chapter 1: "The Architectural System" from *Frank Lloyd Wright and Le Corbusier: The Romantic Legacy*, Manchester University Press, New York, 1994
Prophyrios, Demetri, Chapter 2, "The Anatomy of Buildings" from *Sources of Modern Eclecticism; Studies on Alvar Aalto*, London: Academy Editions, 1982.
Lobell, John, "Materials" from *Between Silence and Light: Spirit in the Architecture of Louis I. Kahn*, Shambhala Press, Boston. 1985.
Frampton, Kenneth "Ten Points on an Architecture of Regionalism: A Provisional Polemic" in *Center* 3/1987

Construction Design: Detailing

Allen, Edward and Patrick Rand, *Architectural Detailing*, 2nd edition, John Wiley & Sons, New York
Ching, Francis D. K., *Building Construction Illustrated*, 5th edition, New York: Van Nostrand.
Architectural Graphic Standards, AIA, Ramsey, Bleeper, New York: John Wiley (any edition)
Horsley, F. William, *Graphic Construction Standards*, R. S. Means, Kingston, MA, 1986
Edward R. Ford, *The Details of Modern Architecture*, Volumes 1 & 2, MIT Press, Cambridge, MA

Materials Selection

Beylerian, George M. and Jeffrey J. Osborne, editors, *Mondo Materials: Materials and Idea for the Future*, New York: Harry N. Abrams, Inc., 1990
CSI's "Project Resource Manual" (<http://www.amazon.com/Project-Resource-Manual-PRM-Practice/dp/0071370048>)

Structural Design

Salvadori, Mario and Robert Heler, *Structure in Architecture: The Building of Buildings*, Prentice-Hall, Englewood Cliffs, NJ. 1975

Environmental Design

Mazira, Edward, *Passive Solar Energy Book*, Emmaus, PA: Rodale press, 1979
Watson, Donald and Kenneth Labs, *Climatic Building Design*, New York: McGraw Hill, 1983
Olgyay, Victor, *Design With Climate*, Princeton, NJ: Princeton Press
Lechner, Norbert, *Heating, Cooling, Lighting*, New York: John Wiley, 2001
Cowan, Henry J. & Peter R. Smith, *Environmental Systems*, New York: Van Nonstrand Reinhold
Brown, C. V., *Sun, Wind and Light*,
Wells, Malcolm B., *Gentle Architecture*

Documentation

The National CAD Standard
"SectionFormat" from the *Appendix to The Project Resource Manual – CSI Manual of Practice*, in the CUA Architecture-Engineering library