

I. COURSE INFORMATION:

- A. Division: Science and Math
- Department: Architecture
- Course ID: ARCH 201
- Course Title: Architectural Design II
- Units: 4
- Lecture: 2
- Laboratory: 6
- Prerequisite: ARCH 200
- Corequisite: None
- Dept. Advisory: None

- B. Catalog and Schedule Description: This course is a continuation ARCH 200. Architectural design processes are explored, in addition to the relationships between a variety of programmatic models, normative building types, and technological themes within specific physical, cultural and historic contexts. This exploration includes advanced problems solving in spatial relationships, structures, and human requirements of advanced model building.

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1

III. EXPECTED OUTCOMES FOR STUDENTS:

Upon successful completion of the course, the student should be able to:

- A. Evaluate the similarities between natural structures and man-made structures.
- B. Critically evaluate the distribution of forces throughout a structural system.
- C. Formulate and visualize the distribution of forces in the design of new buildings.
- D. Select appropriate materials to be utilized in the design of new buildings.
- E. Construct scale models of architectural structures.
- F. Evaluate the form, composition, and integration of natural elements in modern design

IV. COURSE CONTENT:

- A. How structures influence the design of buildings – a study of natural structures
- B. Orientation to structural forms and concepts
 - 1. Lateral stability
 - 2. Load distribution
 - 3. Design analysis
 - 4. Structural analysis
- C. Introduction to architectural concepts
 - 1. Integrity and ethics
 - 2. Basic forces
 - 3. Force versus system
 - 4. Structural systems
 - 5. Growth patterns
 - 6. Functional requirements
 - 7. Physical properties of materials
- D. Arches
 - 1. The arch and development of compressive forces
 - 2. Stability of the arch – concepts of form
 - 3. Efficiency of form
 - 4. Planar design elements
 - 5. Uses in bearing walls and current architectural projects
- E. Bearing walls
 - 1. Compressive material
 - 2. Defined spatial limitations
 - 3. Efficiency
 - 4. Geometric considerations

5. Doors and windows in load bearing walls
6. Natural openings
7. Restrictions on planning
- F. Cantilever
 1. Bending and shearing forces
 2. Relation to other structural systems
 3. Division of space beneath cantilevers
- G. Dome
 1. Transfer of load through compression
 2. Circumferential tensions
 3. Load distribution
 4. Design analysis
 5. Structural analysis
- H. Geodesic
 1. Tension and compression
 2. Geometric considerations
 3. Load distribution
 4. Design analysis
 5. structural analysis
- I. Post and beam
 1. Bending and compressive forces
 2. Geometric considerations
 3. Load distribution
 4. Design analysis
 5. Structural analysis
- J. Slab and Shell
 1. Bending and compressive forces
 2. Geometric considerations
 3. Load distribution
 4. Design analysis
 5. Structural analysis
- K. Space Frame
 1. Bending and compressive forces
 2. Geometric considerations
 3. Load distribution
 4. Design analysis
 5. Structural analysis
- L. Suspension, Truss and Vault
 1. Bending and compressive forces
 2. Geometric considerations
 3. Load distribution
 4. Design analysis
 5. Structural analysis

V. METHODS OF INSTRUCTION: (Please check all that apply and add any additional not listed.)

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|-------------------------------------|---|
| <input checked="" type="checkbox"/> | <u>Lecture</u> |
| <input checked="" type="checkbox"/> | <u>Class and/or small group discussion</u> |
| <input checked="" type="checkbox"/> | Critical evaluation of texts, newspapers, journal articles, and other printed research |
| <input type="checkbox"/> | <u>Critical evaluation of</u> films, <u>videotapes</u> , audiotapes, or other media forms |
| <input checked="" type="checkbox"/> | Classroom demonstrations |
| <input checked="" type="checkbox"/> | Field trips |

- Guest speakers
- Other: Laboratory activity
- Other: Directed individual or group projects involving structural and design analysis
- Other:

VI. TYPICAL OUT-OF-CLASS ASSIGNMENTS:

- A. Reading Assignment. Reading assignments are required and may include (but are not limited to) the following: Read the chapter on geodesic construction and list the structural and design considerations.
- B. Writing Assignment. Writing assignments are required and may include (but are not limited to) the following: Find a walnut and separate it into two pieces. Examine the shell and locate the thickest portion of the shell. Write a one page paper explaining your observation using architectural principles.
- C. Critical Thinking Assignment. Critical thinking assignments are required and may include (but are not limited to) the following: Select a structural part of the body (hand, nose, eye, foot, skull etc.)
 - 1. Research different structural forms of the part you selected
 - 2. Illustrate and present at least 6 distinctly different forms
 - 3. Present and describe to the class, how and why each functions and is best suited to it's applications

VII. EVALUATION:

A student's grade will be based on multiple measures of performance and will reflect the objectives explained above. A final grade of "C" or better should indicate that the student has the ability to successfully apply the principles and techniques taught in this course. These evaluation methods may include, but are not limited to, the following (Please check all that apply, and add additional ones not listed):

- Portfolios
- Projects
- Written papers or reports
- Presentations (oral and visual)
- Work performance (internships or field work)
- Lab work
- Comprehensive examinations (cumulative finals or certifications)
- Peer evaluation
- Self evaluation
- Classroom participation
- Homework
- Other:
- Other:
- Other:

VIII. TYPICAL TEXTS:

- A. Architectural Thought and The Design Process: Continuity, Innovation and the Expectant Eye, Brawne, Michael; Architectural Press, 2003.
- B. Architectural Models as Machine: A New View of Models from Antiquity to the Present Day, Smith, Albert; Architectural Press, 2004.
- C. Architectural Details 2003, Schittich, Green, and Anderle-Neill; Architectural Press, 2004.

- IX. OTHER SUPPLIES REQUIRED OF STUDENTS:** Presentation boards, graphing materials, safety goggles, crusher board, balsa wood, string, glue, paper, fabrics, plaster

San Bernardino Valley College
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