



Credit Hours: 3

Catalog Course Description:

This course familiarizes the student with physical properties, grades, and uses of materials generally employed in residential and commercial construction.

How Program Site Will Be Incorporated into the Course:

The city of Shanghai and its surrounding areas will provide students a comparative review of American and Chinese architecture and building techniques. Buildings in Shanghai represent the latest in technological engineering and architectural design. Students will learn green building concepts with visits to architectural and engineering schools, architects, material manufacturers, green building organizations, completed and on-going residential and commercial building projects.

Prerequisites: ARCH 1124 or ARCH 2644 or permission of program coordinator

Textbook(s) and Other Courses:

Fundamentals of Building Construction Materials and Methods, Fifth Edition, by Edward Allen

I. Week/Unit/Topic Basis:

Week 1	Building Process, Foundation and Soils
Week 2	Masonry
Week 3	Steel and Concrete
Week 4	Finishes

II. Course Objectives:

- A. Analyze and evaluate design concepts and technical information relating to the creative selection and application of construction materials most often used in residential and commercial buildings.
- B. Identify construction methods used in constructing particular details and sections of a building utilizing specific materials.
- C. Understand, identify, and create the typical drawing symbols, details, and drawing of materials used in determining the forces and stresses of structures of residential and commercial buildings.
- D. Analyze and interpret specifications and material tests to discover their technical properties, potential problems and design issues.
- E. Develop the ability to function collaboratively and effectively on teams with respect to diversity
- F. Analyze and discuss professional, ethical, and social responsibilities with the introduction of green building design concepts within a global perspective and its application to architectural theory and design

- G. Create oral, written, and graphic presentations using modern productivity software.
- H. Analyze and interpret codes, specifications, and site visits for greater understanding of the creative application of construction materials and methods.

III. Instructional Processes:

Students will:

- 1. Create a journal of notes, drawings, photographs in Google Doc.
- 2. Diagram processes of construction.
- 3. Create construction details.
- 4. Oral and written presentations.

IV. Expectations for Student Performance:

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

- 1. Critically select materials appropriate to design and site considerations
- 2. Identify construction methods and details
- 3. Create construction details and drawings
- 4. Interpret test reports and specification
- 5. Participate collaboratively and effectively on teams with respect to diversity
- 6. Apply green sustainable concepts to green building design
- 7. Create oral, written, and graphic presentation using hand drawn and modern productivity software
- 8. Interpret codes, specifications, and observations from site visits

V. Evaluation:

A. Testing Procedures:

Review of daily journal of notes, drawings, photographs of exercises, site visits
Observations.

B. Research Paper: If applicable

Oral and written presentation on green material.

C. Other Evaluation Methods:

Grading of drawings and diagrams.

D. Grading Scale:

92-100	= A
89-91	= B+
82-88	= B
79-81	= C+
72-78	= C
65-71	= D
Below 65	= F

VI. Policies:

A. Attendance Policy:

Attendance is of utmost importance in study abroad courses. There are no unexcused absences permitted. Multiple unexcused absences are grounds for removal from the program. Being in class on time is also very important. Frequent tardiness will be considered an absence and appropriate action will be taken. Absences due to illness must be reported immediately to the program director.

B. Academic Dishonesty:

Academic misconduct committed either directly or indirectly by an individual or group is subject to disciplinary action. Prohibited activities include but are not limited to the following practices: Cheating, including but not limited to unauthorized assistance from material, people, or devices when taking a test, quiz, or examination; writing papers or reports; solving problems; or completing academic assignments. In addition to other possible disciplinary sanctions that may be imposed as a result of academic misconduct, the instructor has the authority to assign either (1) an F or zero for the assignment or (2) an F for the course.

VII. Instructional Hours:

This course will consist of a minimum of 37.5 full hours of formal instruction.

**ARCH 1244 Material and Methods Syllabus (3750 minutes) Course Outline.
June 1, 2012- June 30, 2012**

Site Visit Projects: Students will take photographs and notes to summarize site and manufacturer visits. Diagramming, mind maps, and drawings should be included to demonstrate understanding.

Inspection Project: Monitor and record the construction of a building from beginning to end throughout the travel month.

Weekday -22 days = 170.45 minutes per class. Visit to Architectural school at Tongji University

Weekends- Visit Cultural sites, significant architectural buildings, gardens, and museums

WEEK ONE- BUILDING PROCESS, FOUNDATION, SOILS, WOOD

1. Making Buildings
 - Visit to green architect to discuss steps of making a building with LEED, Three Star ratings, and sustainable design.
 - Codes and zoning
 - Project team
 - Construction process
2. Foundations and Soils
 - Soils and testing-Visit geotechnical engineering program at Tongji University to observe soil tests
 - Foundation types
 - Pilings
 - Waterproofing and drainage-View construction sites
3. Wood
 - Trees-Native trees Visit Arborist and discuss trees
 - Visit Saw Mill- Shanghai Sin Soon Lee Sawmill Co
 - Visit Plywood or panel factory
4. Heavy Timber Frame Construction
 - Visit historic heavy timber construction Chinese house
5. Wood Light Frame Construction
 - View video on layout of Wood Light Frame foundation
 - View video or actual construction of construction of Wood Light Frame Construction
 - Visit Building Code inspectors to discuss requirements
 - Visit Ecohome- Shanghai Research Institute of Building Science -Future typical future house
 - Visit existing typical Chinese house to see current sustainable practices

WEEK TWO- MASONRY

6. Exterior Finishes for Wood Light Frame Construction
 - View installation of exterior finishes
 - Painting
 - Siding
7. Interior Finishes for Wood Light Frame Construction
 - Review green insulation options

- Fireplaces
- Interior doors
- Millwork and stair construction
- 8. Brick Masonry
 - Visit brick manufacturer - Changshu Tongjiang Manufacturing Co., Ltd.
 - View the installation of brick wall
- 9. Stone and Concrete Masonry
 - View stone quarry to observe quarry process
 - View concrete masonry unit (CMU) manufacturer
 - View installation of CMU wall
- 10. Masonry Wall Construction
 - View types of masonry walls
 - Reinforcing masonry walls
 - Insulating and drainage details of masonry walls
 - Masonry wall problems and failures

WEEK THREE- STEEL AND CONCRETE

- 11. Steel Frame Construction
 - Visit Steel Mill- Shagang Group-sustainable practices
 - Visit erection of steel frame building
 - View fireproofing of steel frame
 - Visit Structural engineer at Structural engineering program at Tongji University
 - Visit Tensile structure
 - Visits Space frame building
- 12. Light Gauge Frame Construction
 - Visit Light gauge metal manufacturer
 - Visit Pre engineered building manufacturer
 - Visit site erection
- 13. Concrete Construction
 - Visit Concrete making
 - Visit **College of Material Science and Engineering** at Tongji University- see concrete testing
 - See green and innovative concrete and applications
- 14. Sitecast Concrete framing systems
 - Visit tilt up wall construction
 - Visit sitecast concrete shell buildings
- 15. Precast Concrete Framing Systems
 - Visit precast concrete structural manufacturer
 - Visit installation of precast building

WEEK FOUR- FINISHES

- 16. Roofing
 - Visit installation of low slope roof
 - View roof details of roof drains, parapet coping
 - See green roofs using plants
 - See photovoltaic roof applications
- 17. Glass and Glazing
 - Visit glass manufacturer

College of Material Science and Engineering at Tongji University for Innovative glass –Self cleaning glass, chromogenic, electrochromic glass, Gasochromic, plastic glazing-polycarbonate, aerogel-filled glazing
Installation of curtain wall

18. Windows and Doors

Shanghai Mingye Door and Window Decoration Co., Ltd.

Visit door manufacturer

19. Cladding with Masonry and Concrete

Visit concrete and masonry panel manufacturer

20. Cladding with Metal and Glass

Visit curtain wall manufacturer

21. Interior Walls and Partitions

Site visit-visit drywall manufacturer

View installation of drywall

22. Finish Ceilings and Floors

Site visit-view installation of drop in ceiling

View installation of stone

View installation of bamboo or wood floor

Weekends-Travel

Ride the rapid rail from airport to Shanghai

Visit Cultural sites, significant architectural buildings, gardens, historic sites, and museums