This course studies historic cultural objects in depth through a study of common traditional and contemporary building materials. We will examine basic properties of different materials, the ways they have been transformed into building elements, assemblies and systems, typical causes for their changes over time, and protocols for their conservation. The principal product of the class is a comprehensive and detailed building investigation, known as a *Historic Structure Report*, on a property chosen by each student.

One or more field trips to ongoing preservation projects will take place during the course of the semester.

There will be a take-home mid-term exam on building materials properties and characteristics, and several one-week exercises. Students are expected to present in class regularly information gleaned from the readings.

**Grading:**

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<thead>
<tr>
<th>Exercise</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Exercise 1: Brief Building Description</td>
<td>7.5%</td>
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<tr>
<td>Exercise 2: Building Condition</td>
<td>7.5%</td>
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<tr>
<td>Midterm Exam on Building Materials</td>
<td>25%</td>
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<tr>
<td>HSR Presentation</td>
<td>5%</td>
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<tr>
<td>Historic Structure Report</td>
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No more than two unexcused absences are permitted.

**Required Texts:**


**Also Recommended:**

- Mark Fram, *Well-Preserved*, Boston Mills Press
Jan. 21 - Week 1: Introduction
Explanation of the purpose, content and requirements of the course; review of the bibliographic materials and books on reserve. Plus the following topics:

The Nature of the Project Process
Analysis, Description and Prescription
The Project Team
The Secretary of the Interior’s Standards for HSRs
History, Condition, Program
Identifying a Treatment
Recommendations and Alternative Designs for Treatment
Project Cost Analysis
Management and Maintenance

Parts of a Building; Structure and Structural Systems; and the Nature of Materials

Parts of a Building and Structural Concepts
Gravity, Wind and other lateral Loads
Tension, Compression, Shear, Moment, Deflection
Frames, Bearing Walls, Arches, and other systems
Foundations, Walls, Roofs and other assemblies

The Nature of Materials
Performance = behavior/time. Behavior = properties x stresses.
Condition analysis tools and techniques

Reading: Ching: 2.5-2.19; Arbogast, Chapters 1, 2 and 3; Preservation Briefs 17, 35, 43

Exercise 1: Building Description and Analysis: 5-10 pages max, text and images.

Jan. 28 - Week 2: Exterior Enclosures and their Materials

Systems
Roofs and Walls
Doors, Windows and Glazing

Reading Contract Documents, I
How to read and understand historic working drawings, especially wall and roof assemblies

Readings: Preservation Briefs 4, 8, 13, 19, 22, 29, 30, 42, 45, 47

Exercise 1 Due
Exercise 2 Assigned: Condition Description and Assessment: 5-10 pages max, text and images.

Arbogast, Chapter 4

Feb. 4 - Week 3: Interior Finishes and their Materials

Systems and Materials
Walls, Floors, Ceilings
Plasters, Paints, Fabrics

Reading Contract Documents, II
Schedules and other information on products and finishes

Readings: Preservation Briefs 18, 21, 23, 28, 34, 40; Arbogast: Chapter 9

Exercise 2 Due
Assignment 3 Assigned: Identify project site. Submit one page description of the building, its age, style and major issues.

Feb. 11 - Week 4: Wood

A brief look at the development of 18th, 19th and 20th century woodworking tools, technology & its effects on construction and decoration in what became known as the United States. The invention and evolution of fiberboard, Haskelite, plywood and glue-laminated timber. Timber properties; wood decay; insect infestation, protective measures; epoxy repair; considerations for the “replacement in kind” of wooden components and wood composites. Early phenolics and other “plastics”; their deterioration and conservation.

Reading: Weaver Ch. 4; Preservation Brief 9; Arbogast: Chapter 10

Feb. 18 – Week 5: Stone


Reading: Weaver Ch. 5; Preservation Briefs 2, 5, 7; Arbogast: Chapter 11

Feb. 25 - Week 6: Adobe, brick, terra cotta, and ceramic veneer

Manufacturing and development of these materials during the 18th, 19th, and 20th century. The conservation of earthen-based construction materials and ceramic veneer. Adobe and brick decay, cleaning and repointing brick; repair of roof tile; terra cotta, and the replacement of masonry units. Rising damp: its origins, monitoring and control.

Reading: Weaver Ch. 6

Mar. 4 - Week 7: Cements

The mining and manufacture, and use of limes, cements, plasters, “artificial stone,” concrete, reinforced concrete, and pre-cast concrete during the 18th, 19th and 20th centuries.

Readings: Weaver Ch. 7; Preservation Briefs 15, 21, 22, 23, 42; Chusid: Saving Wright, Chapter 5

Mar. 11 - Week 8: Metals

Ferrous and non-ferrous metal production and fabrication during the 19th and 20th century; nail cutting; hardware study. Decay in iron, steel, copper, bronze, tin, lead, and aluminum; prominent alloys; repair and restoration techniques.

Readings: Weaver Ch. 9; Preservation Brief 27; Arbogast: Chapter 12


Plastics, Curtain Walls, Linoleum, etc. How modern architecture may, or may not, differ from traditional architecture in terms of integrity and authenticity.

Readings: Prudon, Chapters 1, 2, 4; Jester

Take Home Midterm given out in class, due by 10:00 am 3/24 in professor's mail box in Rm. 106 W. Sibley
Mar. 25 - Week 10: Updating Systems and Accessibility
Natural ventilation, heat gain and heat loss in historic structures; insulation; condensation and conservation. Long- and short-term maintenance, fire codes, fire protection, security systems, public access/handicapped accessibility problems.

Readings: Preservation Briefs 24, 32
Assignment: Part 1 of HSR Due: History, Significance, and Architectural Description

April 1 - Week 11: Spring Break

Apr. 8 - Week 12: Guest Lecture TBA

Apr. 15 - Week 13: Project Economics

Dodge Cost Estimating and other components of a project budget

Assignment: Part 2 of HSR is due: Condition Assessment.

Assignment: Schedule site visits with professor.

Apr. 22 - Week 14: Management and Maintenance Plans

Stewardship of the physical object after the project is ended.

Readings: TBA

April 29 - Week 15: HSR Class Presentations

May 15 - Part 3 of HSR due: Recommendations for Treatment and Cost Estimate.

All three parts of the HSR to be assembled and turned in by 4 pm to 106 W. Sibley.