HIPR 6510, Cross-listed as ARCH 6351

Building Conservation

**Credit Hours:** 3  
**Time:** Friday 9:30-12:15  
**Place:** 320C

**Description:** This course emphasizes the relationship between knowledge acquisition, professional judgment, and design modification. Four modules cover:

1. Historic Building Types & Methods
2. Issues of Sustainability in Building Conservation
3. Field and Lab Methods of Building Assessment
4. The Professional Management of Building Rehabilitation

The course takes an integrative approach to the scientific, aesthetic, managerial and professional dimensions of preservation.

Instructor: Melanie Short  
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E-Mail: MELANIE.SHORT@UCDENVER.EDU  
Office hours: Friday 8:30-9:30  
By appointment only

**Course Objectives:**

**Building Assessment -- Field and Lab Methods:**
- Understand the differences between assessment, surveying, monitoring, and testing and when each is appropriate.
- Understand issues around lab and field safety, physical properties of historic materials, and deterioration mechanisms.
- Understand the basic techniques of scientific field and laboratory investigation and analysis for the following historic building materials: Masonry (brick and stone), metals, wood, and paint.
- Acquire experience in inferring information from historic buildings and records pertaining to them.

**Historic Building Types and Methods:**
- Understand the structure and systems of older buildings including the results and effects of technological change, and how buildings and materials age.
- Understand materials used in the construction of historic buildings and how they differ from those used in contemporary construction.
- Acquire experience in recognizing typical 19th and 20th C. construction types and preservation issues related to them.

**Issues of Code Upgrades and Sustainability in Building Conservation**
- Understand contemporary policy debate on the energy efficiency and sustainability of the heritage “building stock”
- Understand standards and codes: Model building and energy codes; LEED criteria; alternative measures.
- Understand analytical concepts of embodied energy and life cycle analysis as they apply to preservation.
- Understand typical inherent sustainable features of historic structures

**Professional Management of Building Rehabilitation:**
- Understand the role of the members of the project team: architect, owner, conservator, engineer, contractor, archaeologist, building inspectors, and craftsperson.
- Understand various institutions and standards and their roles in implementing the findings of various preservation values. This includes the Secretary of the Interiors Standards for the Treatment of Historic Buildings as well as other standards.
- Understand construction management issues of historic preservation
- Acquire experience in how to design and specify a repair and or replacement program.

**Required Texts:**

**Highly Recommended Texts:**
Gale, Frances Editor *Preservation Technology Primer: Readings from the APT* Bulletin Association for Preservation Technology International Springfield, IL 2008

**Attendance, assignments and grading policy:**

**Attendance and participation in class**
- Class meets weekly so attendance is very important
- Productive participation in class discussions is highly desirable. Be prepared to answer and ask questions based on weekly topics and present information to your classmates.
- Unexcused absences beyond two class periods or field session will reduce the final grade by 1/3 of a grade for each additional absence. Absences should be pre-approved by the lecturer.
- 15% of the final grade is for class attendance and participation.

**Assignments**
Written assignments must be submitted at the beginning of class on the scheduled due date. Late assignments will be penalized 3 points for each week late. Work should be submitted in Canvas.

**Exterior Condition Assessment**
- Choose a building on campus, either on the 9th street historic mall, one of the churches or another building 50 years or older. First come first serve, but only one student will be able to work on each building, so choose early and choose wisely.
- Photograph the building and be prepared to present a 5 minute PowerPoint presentation to the class on your selected building materials, conditions and recommendations.
- Describe the exterior materials and architectural features of your selected building. Assigned readings should be referenced for proper terminology and date/period identification. Footnote your sources. At least the main façade of large buildings should be described, all facades if the building is accessible. It is not expected that you will need to access the interior or climb on the roof for this assignment.
- Describe the condition of these materials and assign each material a condition per History Colorado’s State Historical Fund Annotated Scope of Work for Historic Structure Assessments with the exception of interior and HVAC/electrical issues. Be prepared to present a 5 minute presentation on the materials and conditions assessed. Submit a rough draft based on field investigation, observations and causes of deterioration.
- Provide recommendations for treatment, ongoing maintenance or further investigation as appropriate using Preservation Briefs and other readings as resource material. Make adjustments per comments received from instructor’s review of the draft report. Be
prepared to present a 5 minute presentation on the recommended treatment options and why they were chosen.

- Submit a final report, annotated with the photographs taken.
- 20% of the final grade for final report. This will be a semester long project.

**Worksheets on Readings**

- Five questions related to readings for the week in short essay form will be provided in class.
- 5% of final grade

**Mid Term Exam**

- In class essay exam
- Select 3 of 5 topics selected by the instructor.
- Exam will be worth 25% of final grade

**Final Presentation**

- Final poster shall be presented to invited guests, instructors and classmates. The final research summary shall be submitted to the instructor along with the printed poster.
- Students will be asked to select one of five possible topics for research as selected by instructor based on the case study of the Governor’s Mansion project. Possible types of research include, but are not limited to similar case studies, literature reviews, material and technology studies, new technology and its application to historic structures and in particular the challenges faced by the Colorado Governor’s Mansion past and present.
- Post a 500 word abstract of your approach to the topic to Canvas. Each student is required to comment on two other students’ presentation topics. Prepare to present your abstract to the class.
- Possible information sources for case studies include personal experience from a project with which you are involved, access to individuals involved in the profession, and previously published case studies.
- For literature reviews, available research on the chosen topic should be reviewed and summarized. Analysis of further needs and investigations should be included.
- Material and technology studies could include hands-on demonstrations or a poster illustrating a process such as the use of wood epoxies and fillers for the restoration of historic windows or the use of appropriate patching material on stone masonry.
- New technology and its application could include hands-on demonstrations or a poster illustrating the development of the technology, its intended applications (if not for historic structures), and how it is being or could be used in the building conservation field.
- Poster and research summary will be worth 35% of final grade

**Grading**

- 15% of the final grade is for class attendance and participation.
- 20% of the final grade is for the exterior assessment
- 5% for worksheets on readings.
- Mid-term exam will be worth 25% of final grade
- Poster and research summary will be worth 35% of final grade
- Unexcused absences beyond two class periods or field session will reduce the final grade by 1/3 of a grade for each additional absence.
- Late assignments will be penalized 3 points for each week late.
Grades are determined using an absolute scale. Total possible points for the semester are 100. Each percentage point listed above is worth a point, point ranges for grades are 100-88-A range, 87-75-B range, 74-62 C range, 61-50 D range, below 50 is a failing grade.

**Student Policies:**

**Academic Honesty**
- Plagiarism is the use of another person’s words or ideas without crediting that person. Plagiarism and cheating will not be tolerated and may lead to failure on an assignment, in the class, and dismissal from the University. (Refer to School/College guidelines.)
- You are responsible for being attentive to or observant of campus policies about academic honesty as stated in the University’s Student Conduct Code. (http://thunder1.cudenver.edu/studentlife/studentlife/discipline.html)

**Access, Disability, Communication**
- The University of Colorado at Denver and Health Sciences Center is committed to providing reasonable accommodation and access to programs and services to persons with disabilities. Students with disabilities who want academic accommodations must register with Disability Resources and Services (DRS), 177 Arts Building, 303-556-3450, TTY 303-556-4766

**Course Communication**
- In addition to announcements made and written handouts distributed in class, I may need to contact you between classes, which I'll do through individual and group email messages. You are responsible for any messages, including assignments and schedule changes, I send you via canvas. You also may contact me via email, in addition to seeing me during office hours.

**Civility**
- Turn OFF cell phones during class. Adherence to the Student Conduct Code is expected. If you text during class, you will be asked to leave. The midterm will be based on lecture topics, as will the poster presentation, so attendance will be crucial to success. You will have breaks during class to check in, if there is an emergency situation requiring your phone to remain on please inform the instructor prior to class.
- My commitment is to create a climate for learning characterized by respect for each other and the contributions each person makes to class. I ask that you make a similar commitment.

**Students called for military duty**
- If you are a student in the military with the potential of being called to military service and/or training during the course of the semester, you are encouraged to contact your school/college Associate Dean or Advising Office immediately.”
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<tr>
<th>Week - Topic</th>
<th>Agenda</th>
<th>Readings / Assignments</th>
<th>Tour</th>
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<tr>
<td>Jan 20 - Week 1 – Introduction; the various institutions, their standards, and their roles in implementing the findings of various preservation values.</td>
<td>Introduction and Syllabus review; Logistics and expectations</td>
<td>None for this class</td>
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<td>Jan 27 – Week 2 - The historic structures assessment (HSA) historic structures report (HSR) and its variants</td>
<td>HSR components and the annotated scope of work for Historic Structure Assessments</td>
<td>Preservation Briefs 17 and 18 Waite, Palazzo and Jenkins “Watching the Evidence; An HSR to Guide the Preservation of George Washington’s Mount Vernon” (APT primer) Chapter 1 and Appendix A Young DUE TODAY: Submit Building Choice</td>
<td>9th Street Historic District and other on campus historic buildings</td>
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<td>Feb 3 - Week 3 – CPI conference</td>
<td>Please attend the CPI conference if possible – no class will be held.</td>
<td>Preservation Briefs 35 Silman “Applications of non-destructive evaluation techniques in historic buildings” (APT primer)</td>
<td>None for this class</td>
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<td>Feb 10</td>
<td>Week 4 – Field and lab methods of investigation; investigation of construction sequences construction. Why is it wet? Foundations, walls, windows and roofs.</td>
<td>Case Studies: Field investigation and how to determine what was built when. Identification of water infiltration at foundations, walls, windows, roofing and flashing conditions</td>
<td>Stockbridge “Crack Evaluation and Monitoring” (APT primer) Preservation Brief 39 and 43 Weber and Johnson “Investigative techniques for water penetration” (APT primer) DUE TODAY: Worksheet</td>
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<td>Class Presentation on building – 5 minute PowerPoint</td>
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<td>Feb 17</td>
<td>Week 5 – Masonry structures</td>
<td>Types of brick, stone and their relative affect on water migration issues, thermal mass issues, stress and deformation of the mass wall, mortar issues</td>
<td>Preservation briefs 1 and 2 Chapters 5 and 6 Young Preservation Brief 10 and 20 Weber “Condition of Timber…” (APT Primer) DUE TODAY: Condition of building exterior materials</td>
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<td>Case Studies: Tivoli Student Union</td>
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<td>Feb 24</td>
<td>Week 6 – Frame and heavy timber structures</td>
<td>Wood frame structures and heavy timber, grading of existing structure in place, wood species identification and structural analysis of</td>
<td>Preservation brief 10 and 20 Weber “Condition Assessment of Timber…” (APT Primer)</td>
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<td>Date</td>
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<td>Mar 3</td>
<td>Week 7</td>
<td>Steel, Copper, Cast Iron and Wrought Iron characteristics, methods of deterioration and means of restoration and repair</td>
<td>Chapter 4 Young</td>
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<td>Mar 10</td>
<td>Week 8</td>
<td>Introduction to the Governor’s Mansion, history, master plan, preservation projects, current conditions and final presentation topics.</td>
<td>Preservation Briefs 13 &amp; 27</td>
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<td>Mar 17</td>
<td>Week 9</td>
<td>MIDTERM PRESENTED to be SUBMITTED AT END OF CLASS</td>
<td>Preservation Briefs 03, 16 and 47</td>
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SPRING BREAK MARCH 20-24 NO CLASS
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| March 31 - Week 10 - Traditional building systems and inherent sustainable features of historic buildings. - field session of case study of historic LEED certified buildings in Denver, Colorado | Introduction to LEED and sustainable preservation issues and opportunities. Case Study – Empire State Bldg envelope replacement, issues of insulating masonry walls and appropriate coatings for various materials including wood and masonry | Preservation Brief 3 and 24  
*Chapter 22 Young*  
Schwartz “Glass and Metal Curtain-Wall Fundamentals” (APT Primer)  
**DUE TODAY:** Abstract due | **Engine House No. 5** |
| April 7 - Week 11 – Energy inputs: utilities, environmental controls, LEED issues, life cycle costing, embodied energy and the Energy code as it applies to historic structures | Case studies: How was the building meant to work, what have we done to it to lessen the comfort, vernacular designs to take best advantage of regional microclimates | Preservation Brief 9 and 13  
*Jackson “Embodied Energy and historic preservation: A needed reassessment” (APT primer)*  
*Chapter 19, 20 and 21 Young* | **Emerson School** |
| April 14 - Week 12 – Code related issues in continued use and reuse: field session of case studies of historic code upgraded buildings in Denver, Colorado | Introduction of IEBC and the alteration levels | Preservation Brief 41 and 32  
*Alderson and Artim “Fire-Safety Retrofitting: innovative solutions for ornamental building interiors”*  
*Chapter 2 Young* | None for this class |
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<tr>
<td>April 28</td>
<td>Historical preservation</td>
<td>Small group breakout session with each student taking on a role in a</td>
<td>Rough draft of poster presentation due – bibliography and research summary final</td>
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<td>redevelopment project.</td>
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<td>May 5</td>
<td>How to design and specify a rehabilitation project – paint analysis</td>
<td>Introduction to specifications specific to rehabilitation projects - review drawings and specifications.</td>
<td>Specifications: 013510 Special Procedures for Historic Treatment</td>
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<td>040120 Maintenance of Unit Masonry</td>
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<td>05911 Treatment of historic ornamental cast iron</td>
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<td>069100 Exterior Woodwork Rehabilitation</td>
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<td>080152.93 Historic Treatment of Wood Windows</td>
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<td>090190 Maintenance of Painting and Coatings</td>
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<td>May 12</td>
<td>Finals week</td>
<td>Student presentation of Poster presentations</td>
<td>Poster Presentations</td>
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**Unit 4 – Professional Management of Building Rehabilitation**