CHEM 100: Light at the Museum – the Science and Art of Conservation
Fall 2019

Instructor: Prof. Kristin Wustholz, ISC 2041, 757-221-2675, kwustholz@wm.edu (email is the best way to contact me), she/her/hers

Office Hours: W 3:30 – 4:30 pm and by appointment

Class Meetings: MW 2 – 3:20 pm and F 2 – 2:50 pm, ISC 1280, we will occasionally meet in a different location (Swem Library, Dewitt Wallace Decorative Arts Museum, and Collections and Conservation Building at Colonial Williamsburg)

Course Description
“Every day, the vision of artists, the identity of peoples, and the very existence of history all threaten to disappear. Left alone, old buildings will crumble. The Declaration of Independence will disintegrate. The photographed faces of battle-weary Civil War soldiers will fade away... “
– American Institute of Conservation

By melding science with art, conservation professionals protect and preserve the physical artifacts of our cultural heritage. How are science and art used to slow or prevent deterioration? What can science tell us about art? What can art tell us about science? How does experimentation lead to knowledge and innovation in both the scientific and artistic domains? We will examine these questions by investigating the materials and technology used in creating and conserving art. You will engage in the course material through reading, writing, and meeting with guest speakers, hands-on experimentation, delivering presentations, as well as visits to museums and conservation labs. In this COLL 100 course, you will be challenged to think rigorously, and to develop communication skills beyond the written word. Over the course of the semester you will build the knowledge and skills necessary to create a presentation to the class on a museum object. In this presentation, you will analyze the results of a technical examination and their bearing on the artwork itself as well as describe how the artwork informs science. Class meetings will be a mixture of discussion, lecture, in-class activities, communication workshops, trips, and student presentations.

This course has two broad goals:
• To introduce you to the field of painting conservation and the ways in which experimentation (in both the artistic and scientific sense) can lead to innovation.
• To provide opportunities for you to collaborate with peers on assignments and projects that model real-world practice in the museum setting, with an emphasis on non-written communication.

Learning Objectives
After completing this course – as an active partner in the learning, communicating, and creating process – you will be able to:
• Describe the materials that are used to create easel paintings.
• Understand and explain the light-matter interactions that are important in the creation, visualization, and deterioration of paintings.
• Demonstrate, discuss, and assess the scientific methods that are used by conservation professionals to study paintings.
• Examine and explain the ways in which artistic experimentation leads to scientific innovation.
• Locate and evaluate sources for your conservation research project.
• Apply your knowledge of artists' materials and modern scientific techniques to examine a current problem in painting conservation.
• Create and deliver presentations that communicate effectively your knowledge of conservation and how science and art are used together to examine a painting.

Required Reading
The required text for this course is: Kirsch, A.; Levenson, R. Seeing through Paintings: Physical Examination in Art Historical Studies; Yale University Press: New Haven, 2002. Additional reading assignments will be posted on Blackboard and will come from the following sources:
• Journal articles from the National Gallery Technical Bulletin

Assessment
Research Project (50%): The main assignment in this course is a semester-long research project where you will build the knowledge and skills necessary to create a presentation to the class on a museum object. In this final presentation you will explain, interpret, and analyze the results of a technical examination and their bearing on the artwork itself (e.g., historical significance, attribution). Research presentations will also describe how this particular museum object (e.g., the materials and methods used in its creation or conservation) has led to new knowledge in science. Project milestones are set up throughout the semester to help you understand your topic as well as build the skills necessary to communicate your findings to the class. These milestones include both individual and group assignments as follows:

• Encyclopedia vs. Wikipedia: This information literacy assignment is a short summary on a painting material of your choosing. (20 pts)
• Presentation 1 (A Material): Individuals will deliver a 1–2 min. presentation (1 slide) on the painting material. (20 pts)
• Choose a Painting: Investigate a painting that interests you during a research workshop at Swem Library. Submit a written rationale of your choice (~1 paragraph) that explains why you are drawn to the painting together with an annotated bibliography of the key sources you plan to use. (30 pts)
• Create and Revise a Slide: Individuals will create draft slides for their second presentation and groups will review and revise the slides during a presentation workshop. (20 pts)
• Presentation 2 (A Painting): Working with a small group, deliver a 5–7 min. presentation (2-3 slides) summarizing a scholarly article on a technical examination of a painting of your choosing. Presentations should focus on one aspect of the technical examination. (40 pts)
• **Complete Annotated Bibliography:** In preparation for the final presentation, individuals will submit an annotated bibliography of at least two scholarly articles from the literature on a specific painting and one reputable source for the scientific method. (60 pts)

• **Peer Review:** Each student will critically evaluate a final presentation. Peer reviews are due by 12 pm on the day following the workshop. (20 pts)

• **Final Presentation (Full Technical Examination of a Painting):** Working with a small group, create and deliver a 15–20 min. presentation (5+ slides) that explains, interprets, and analyzes the results of a technical examination of a painting and their bearing on the artwork itself. Presentations will also examine and explain how one aspect of the artwork (e.g., a painting material, method, or style) is connected to scientific innovation. (80 pts)

We will begin the series of presentation assignments by viewing online presentation resources and discussing the features of a high-quality presentation. Teams of students will use workshops to develop presentation skills (e.g., volume, pace, eye contact, etc.) and then work toward slide design and story development using Jean-Luc Doumont’s online resources. As a class, we will use group observations to develop a rubric that will guide the creation and evaluation of the presentations. Detailed information about the individual components of the research project including general instructions, grading criteria, and opportunities for revision will be distributed and discussed in class.

**Quizzes (10% each):** Two quizzes will assess your understanding of the scientific concepts presented in the class and conservation lab settings. Quizzes are open note (including in-class exercises and printed handouts), but using additional resources (e.g., books, the internet, other students, publications, etc.) is not permitted. Content from the research project presentations will be included on the second quiz. There are no exams in this class.

**Homework (15%):** Several homework assignments that assist your preparation for class discussion, quizzes, and your visits to Swem Library, the DeWitt Wallace Decorative Arts Museum, and Colonial Williamsburg’s painting conservation laboratories will be given throughout the semester. Please note that due dates for these shorter homework assignments are not included on the syllabus – they will be discussed in class and posted to Blackboard in advance.

**Participation (15%):** Your engagement during class and visits is expected. Full participation includes coming to class prepared, asking and answering questions, sharing in discussion, collaborating and communicating effectively with your peers, completing in-class exercises, delivering presentations, and supporting the classroom technology policy.

**Grades**

Grading rubrics for each element of the research project will be discussed and posted on Blackboard in advance of the assignment deadline. In some cases, we will discuss and establish specific grading criteria as a group. You must receive a final grade of C- or better to fulfill the COLL 100 requirement. In general, final grades will be established with the following considerations:

- **A = Excellent performance and mastery of the material/skills**
- **B = Very good performance and understanding of the material/skills**
- **C = Adequate performance and understanding of the material/skills**
- **D = Poor performance and understanding of the material/skills**
- **F = Unsatisfactory performance and understanding of the material/skills**
Class Climate
This course is designed to give you opportunities to explore topics in conservation science through instruction, discussion, and collaboration. Together we will create and maintain an atmosphere of mutual respect in which everyone's ideas can be heard. All members of this class are expected to contribute to a respectful, welcoming, and inclusive environment for every other member of the class. All group members are expected to contribute equally to group work and communicate with their group members and me should any issues arise. I will gladly honor your request to address you by a preferred name or gender pronoun.

Classroom Technology Policy
Every one of you contributes to the learning environment of this class through your presence, your questions and discussion points, and the energy you bring to the room. Technology can enhance the learning environment when you use it to seek additional information or document an activity. However, technology can also distract you and those around you to the point that it destroys our carefully crafted learning environment. Accordingly, the use of laptops, tablets, and phones for texting, social media, email, and web browsing unrelated to class is prohibited. The use of laptops for note taking is strongly discouraged. Inappropriate use of technology will result in a substantial reduction in your participation and/or final grade.

Policies
Late submission of materials is typically not permitted. Two class absences for any reason are excused without penalty, but to pass the class, your attendance at the presentations (individual, group, practice, and final) is mandatory. Additional unexcused class absences will lead to a grade-letter reduction in your participation and/or final grade. Any exceptions to these policies will be at the instructor’s discretion in consultation with the Dean of Students Office (757-221-2510, deanofstudents@wm.edu).

Honor Code
The student Honor Code is an important part of what makes William & Mary a special community. I expect you to observe the Honor Code fully and faithfully.

Writing Resource Center
The Writing Resources Center, located on the first floor of Swem Library, is a free service provided to William & Mary students. Trained consultants offer individual assistance with writing, presentation, and other communication assignments across disciplines and at any stage, from generating ideas to polishing a final product. Students are encouraged to make use of this free resource. To make an appointment, visit: www.wm.edu/wrc.

Student Accessibility Services
William & Mary accommodates students with disabilities in accordance with federal laws and university policy. Any student who feels they may need an accommodation based on the impact of a learning, psychiatric, physical, or chronic health diagnosis should contact Student Accessibility Services staff at 757-221-2509 or at sas@wm.edu to determine if accommodations are warranted and to obtain an official letter of accommodation. For more information, please see www.wm.edu/sas.
## Approximate Course Schedule*

<table>
<thead>
<tr>
<th>Week of</th>
<th>Topics</th>
<th>Reading</th>
<th>Key Dates &amp; Activities</th>
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<tbody>
<tr>
<td>8/28</td>
<td>Conservation: Where Art &amp; Science Meet</td>
<td>Kirsch &amp; Levenson, Chpt. 1 (pp. 1-4)</td>
<td>8/30: Visit Special Collections at Swem Library</td>
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<td>9/2</td>
<td>The Support &amp; X-Radiography</td>
<td>Strosberg (pp. 11-23); Shlain, Chpt. 1 (pp. 15-27); Kirsch &amp; Levenson, Chpt. 2 (pp. 5-44)</td>
<td>9/6: Add/drop deadline 9/6: Information literacy workshop at Swem Library (Ford) for Presentation 1</td>
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<tr>
<td>9/9</td>
<td>The Support &amp; X-Radiography</td>
<td>Kirsch &amp; Levenson, Chpt. 2 (pp. 5-44)</td>
<td>9/9: Wikipedia assignment due 9/11: Visit to Dewitt Wallace Decorative Arts Museum 9/13: Information literacy workshop at Swem Library (Ford) for Presentation 1</td>
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<td>9/16</td>
<td>The Ground &amp; Imaging</td>
<td>Kirsch &amp; Levenson, Chpt. 3 (pp. 69-100); Lily Lomboy workshop</td>
<td>9/20: Presentation 1 workshop (style)</td>
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<td>9/23</td>
<td>The Paint Layer: Pigments</td>
<td>Kirsch &amp; Levenson, Chpt. 4 (pp. 101-144)</td>
<td>9/23: Presentation 1, slides due via email by 9/23 at 9 am 9/27: Research workshop at Swem Library for Presentation 2</td>
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<tr>
<td>9/30</td>
<td>The Paint Layer: Pigments</td>
<td>Kirsch &amp; Levenson, Chpt. 4 (pp. 101-144)</td>
<td>9/30-10/2: Color matching activity</td>
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<td>10/7</td>
<td>Examination of The Paint Layer</td>
<td>Kirsch &amp; Levenson, Chpt. 4 (pp. 101-144)</td>
<td>10/7: Annotated bibliography assignment #1 due 10/9: Quiz 1 10/11: Presentation 2 workshop</td>
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<td>10/14</td>
<td>Examination of The Paint Layer</td>
<td>Shlain, Chpt. 8; Jean-luc Doumont, Creating Effective Slides</td>
<td>10/14: Fall break 10/16-18: Create and revise a slide workshop</td>
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<td>Date</td>
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| 10/21     | Presentation 2                             | 10/21-10/23: Presentation 2  
|           |                                            | 10/25: Self & group evaluation due        |
| 10/28     | Trip to Conservation Lab                    | 10/28: No class, withdrawal deadline      |
|           |                                            | 11/1: Color & Perception Symposium         |
|           |                                            | (Trinkle Hall)                             |
| 11/4      | Model Presentation 3                        | 11/8: Annotated bibliography assignment #2 due |
| 11/11     | Workshops                                  | 11/11-13: Research on innovation,        |
|           |                                            | storyboarding, transitions                |
| 11/18     | Practice Presentations                      | 11/18-20: Final presentation workshop     |
|           |                                            | (peer review due 12 pm next day)          |
| 12/2      | Final Presentations, Course Evaluation & Reflection | 12/4: Quiz 2  
|           |                                            | 12/6: Visit to DeWitt Wallace Decorative Arts Museum |

*Any changes to this course schedule will be announced in class and posted to Blackboard. Due dates for shorter homework assignments are not included – they will be announced in advance.

**A field trip to the painting conservation lab at Colonial Williamsburg is tentatively set for Wednesday, October 30 at ~2-4 pm. Transportation will be coordinated in class.

**Additional Resources**

Lily Lamboy, Speaking to Connect, Workshop Videos 1 – 8:  
https://www.youtube.com/watch?v=CgYz---8cus&list=PLKufdZdzoHv3liH8RhRjLX5Fnu2juYkm&index=1

Jean-luc Doumont, Creative Effective Slides video and more available at:  
https://www.youtube.com/watch?v=meBXuTiPjQk

Research Guide for Light at the Museum (Kristy Borda, Science Librarian):  
https://guides.libraries.wm.edu/lightatthemuseum

OSC: Open Stax Chemistry, by Flowers, Theopold, and Langley  
https://openstax.org/details/books/chemistry

OSP: Open Stax College Physics, by Urone and Hinrichs  
https://openstax.org/details/books/college-physics