

**CHEMISTRY IN ART**  
**IDS-4920**  
**Florida International University**  
**Course Syllabus**  
**Spring 2012**

**Department:** Chemistry & Biochemistry and Liberal Studies Program

**Credit Hours:** 3    **Room:** PCA-165    **Time:** TR 5:00-5:50PM

**Prerequisite:** None

**Instructor:** Dr. Piero R. Gardinali

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**Office Hours:** T 2:00-3:00 pm (room TBA) and by appointment

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### **Summary**

This introductory chemistry course for non-science majors explores the intersection of chemistry with the visual arts. Basic principles of chemistry will be applied to the topics of color, paint, paper, clay, glass, metals, photography, and art restoration. No prior knowledge of chemistry is assumed and minimal math skills are required.

### **Purpose of the Course**

To offer a chemistry course to non-science majors that provides not only an interesting relationship to everyday life but also relevant scientific information and skill competencies important in a liberal arts education.

### **Course description**

Since the advent of fire artists have made extensive and creative use of materials at hand with little know of their chemistry. The drive to produce better and more complex creative expressions forced artists into chemistry. This class is designed to explore the relationship between chemistry and art by addressing topics like the interactions of light and matter to produce color, the composition of ancient and modern pigments, the development of art materials like clay, glass and metal alloys and the intricate world of restoration, forgery and authenticity. This is an interdisciplinary course intended for non-science majors. However, it will discuss in detail chemical terms, principles and instrumentation that are fundamental to understand the changes of art through history. Some important aspects of chemistry in art are the characterization or materials (past and present), the formulation of new ones and the evaluation of art work. The class will also explore the fields of authenticity, forgery and dating of artwork and artifacts like Bellini's *Feasts of the Gods* and the *Shroud of Turin*. Because of the nature of the class, invited speakers with specific expertise in both art history or chemical analysis will complement the general class lectures.

### **Suggested lecture topics**

- Arts and science: an introduction and the boundary between subjectivity and objectivity

- Art history: the evolution in ancient art and its relationship with materials and chemicals
- Materials science: structure and properties of matter and the periodic table
- Color and light: the interaction of light and matter
- Chemistry basics: what you should remember by now
- Native metals and their alloys
- Rocks, minerals, crystals, glass and glazes
- Ceramics and clay
- Early paintings: frescos and chemical reactions
- Pigments colorants and media
- Polymers and modern art
- The chemistry of photography
- Archeology of paintings
- Restoration and conservation: color, ethics and the *Sistine Chapel*
- Scientific and artistic evaluations of paintings
- Analytical chemistry of fakes and forgeries
- Fakes and forgeries case studies
- Light and the human brain: how Monet, Degas and van Gogh influenced your vision

#### **Course evaluation:**

Midterm exams (2) 25% of grade February 16<sup>th</sup> and March 22, 2012.

Quizzes or homework (2) 5% of grade, TBA.

Group Case study and peer evaluation 20% of grade (April 5,10,12,17 and 19<sup>th</sup>, 2012).

Graduating seniors have to form groups, lead the group project/presentation, and provide a written commentary as part of the colloquium requirements.

Final examination 25% of grade April 24<sup>th</sup>, 5:00 – 7:00PM.

**Attendance:** Attendance is important since we will have reading assignments and/or quizzes

#### **Suggested text book:**

*Art in Chemistry, Chemistry in Art.* Greenberg, Barbara R., and Dianne Patterson, Second Edition, Teacher Idea Press, 2008. ISBN 978-1-59158-309-7 QD40.G73 2008.

The electronic version is available at the library:

*Art in Chemistry, Chemistry in Art.* Greenberg, Barbara R., and Dianne Patterson. Englewood, Colo: Teacher Ideas Press, 1998.

<http://www.netlibrary.com/urlapi.asp?action=summary&v=1&bookid=21827>

Due to the extensive literature on the topic class notes and reading assignments will be used. There are many on-line resources dedicated to chemistry and art and they will be used extensively in class.

Reading materials will be available as links in my webpage <http://www.fiu.edu/~gardinal> as the material is covered.