

CHEMISTRY OF ART

CHM.285

M/W Lecture 1:00-3:20pm Dalrymple 25

Fall 2011

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Office Hours: M & W 11:00am – 12:00noon or by appointment

Textbooks:

Lecture

Orna, M.V and Goodstein, M.P. (1998). *Chemistry and Artists' Colors*. Available only directly from the author.

Hill, P.S. (2011). *Chemistry in Art*. Available by permission. Handouts supplied

Edwards, D. (2010). *Artscience: Creativity in the post-Google Generation*. Harvard University Press. ISBN: 987-0674034648

Lab

Hill, P.S. (2011). *Chemistry in Art Laboratory Manual*. Available by permission. Handouts & lab notebook supplied for \$5. fee

Safety eye goggles

Rubberized safety apron

Course Description:

This offering of CHEMISTRY OF ART will examine and evaluate the science of chemistry in art by examining the chemical and physical properties of light, paint, ink, dyes, glass, ceramics and photography. Students will learn basic fundamentals of chemical science which can then be used to explain questions like: What makes red light appear different than blue or why oil paint gives such a different visual effect than watercolor? Pre-requisites for the course include MAT 101 College Algebra – letter grade $\geq C$ or permission from the instructor.

Goals and Objectives:

The purpose of this course is to gain an understanding of the chemical nature of artistic media. All students are expected to work to their fullest potential in an effort to achieve this goal. Any student presenting special needs may request assistance. This request should be made within the first 2 class sessions to obtain the benefit of early attention. Each request will be evaluated based on what is fair and equitable for the student and for the

class as a whole.

Course Rationale:

CHEMISTRY OF ART will be an important preparation course for Chester College students as they become professional artists. This course will serve as an introduction to the study of chemical composition of artistic materials and the impact these materials have on the health of the artist and safety to the environment. Also, a greater understanding of the chemistry behind the art will be also helpful in the expression of the work.

Course Objectives:

The objectives for this course are listed below. The student is to acquire a solid working knowledge of the following topics in Chemistry:

- Key terms in chemistry ex. atoms, molecules, elements etc...
- Periodic table & elements
- Balancing chemical equations
- Atomic structure & electron distribution
- Lewis dot structures
- Electromagnetic spectrum
- Molar mass & Avogadro's number
- Energy & heat – thermodynamics
- Solvents & solutes
- Percent, ppm, ppb & molarity
- Ionic & covalent bonds
- Acids, bases & pH
- Plastics & polymers
- Functional groups
- Polymerization
- Chemical composition of carbohydrates, proteins & lipids

Web Access:

Class lecture slides and material will be available on the college website at www.chestercollege.edu/litchgray

Class Attendance:

Class attendance in lecture and laboratory is mandatory. **TEXTBOOKS must be available for use in class & lab.** In the event of illness or serious personal matters, please notify the instructor of your absence as soon as is feasible. All students attending class are asked to afford courtesy to the Instructor and their fellow classmates by please adhering to the following:

- Raise your hand when you wish to be recognized for a comment or question.
- Please do not talk during the lectures except when recognized by the Instructor or when in Discussion Sections.
- Please disarm the ringer on cellular phones. (cell phones via texting will be utilized for a new question answering technique)

THANK YOU FOR YOUR CONSIDERATION IN THESE MATTERS

Testing:

Class quizzes will be comprised of short-answer, matching, multiple choice and short essay questions including

mathematical problems utilizing basic algebra skills. Lab quizzes will be held every Wednesday prior to the start of lab. They will assess your preparedness for lab. There are no scheduled make-ups for quizzes. Please notify the instructor of an absence prior to the class or as soon as is physically possible. The Final exam will be cumulative and cover class material specifically.

Academic Honesty Policy:

Please note the Academic Honesty Policy as is mandated in the Chester College Academic Catalog on page 18-19 and required to be adopted by all students. All are reminded that academic dishonesty is unethical and a violation of the academic honesty policy of the College. Any student found guilty of academic dishonesty will be subject to the penalties in the catalog. Please refer to and abide by this policy as written.

Art Conservation Technique Project:

Students will choose an art conservation technique from a supplied list. A short paper (2-3 pages not including references) on the technique will be due on **OCT. 26**. The paper should include a description of the technique, the chemistry involved and the uses in art conservation and/or restoration.

ArtScience Discussions:

Five times during the semester we will dedicate time in class to discuss a chapter in ArtScience: Creativity in the post-Google Generation by David Edwards. Points will be awarded for relevant and insightful class participation in the discussion and content in a 1-2 page reflection on the reading.

Chemistry in Art Project & Presentation:

Each student will be responsible for choosing and researching an artist and the chemistry of their chosen medium. A written paper will be submitted (8-10 double spaced pages not including references). The contents of the paper must include 1) introduction to the artist 2) introduction and description of the artistic process/technique used 3) historical background of its use 4) chemicals and chemical processes involved 5) chemical hazards and/or steps taken to avoid hazard 6) analysis of specific examples/pictures of the art form generated with the technique. The paper is **FIRST** submitted by email on **NOV. 7**. The paper will be briefly reviewed and comments supplied. **FINAL** submission will occur on **NOV. 28**. Each student will also prepare a lecture (10 minutes) on his or her chosen topic to be presented on **December 7, 2011**. Presentations must include a PowerPoint and may also include other visual aid(s) such as handouts, posters, models, overhead projections, demonstration etc...

Class Grading:

6 quizzes (25 pts. ea.)	150 pts.
Final Exam (100 pts. each;)	100 pts.
ArtScience Discussions (10pts. ea.)	50 pts.
Chemistry in Art Project & Presentation	<u>100 pts.</u>
	400 pts.

Laboratory Grading:

Laboratory notebook	100 pts.
Art Conservation Technique Project	25 pts.
Pre-lab quiz (10 pts. ea.)	<u>100 pts.</u>
	225 pts.

Class Total

625 pts.

<u>Week</u>	<u>Date</u>	<u>Topic</u>	<u>Chapter(s)</u>	<u>Mon. Quiz</u>	<u>ArtSci (W)</u>
1	8/31	Introduction - Art & Science	1		
2	9/6 & 7	Measurement and Metrics Light and Color	2-6		
3	9/12 & 14	Color Mixing	9-12		1
4	9/19 & 21	Matter	7,8, 13,14	1 (1-6)	2
5	9/26 & 28	Metals & Inorganic Compounds	15,16		
6	10/3 & 5	Glass and Ceramics	22	2 (7-14)	3
7	10/10 & 12	Mon. COLUMBUS DAY – no class Chemical Reactions	handouts	3 (15,16,22)	
8	10/17 & 19	Mon. Field Trip to MFA Research Labs - Art Conservation Chemical Reactions con't	handouts		
9	10/24 & 26	Organic Compounds & Polymers	handouts		
10	10/31 & 11/2	Dyes	17	4	
11	11/7 & 9	Pigments	18		
12	11/14 & 16	Paints	19	4 (handouts & 17)	
13	11/21 & 23	Paints con't Wed. THANKSGIVING HOLIDAY – no class			
14	11/28 & 30	Photography	20, 21	5 (18,19)	7

15

12/5 & 7

Art Hazards

23

6 (20,21)

Project Presentations

FINAL EXAM - date to be announced

CHEMISTRY of ART LABORATORY

CHM.285 L

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Fall 2011

<u>WEEK</u>	<u>LAB TOPIC</u>	<u>EXPERIMENT</u>	<u>LAB QUIZ</u>
9/7	Introduction & cave art		
9/14	Understanding color	1	
9/21	Color mixing	2	1
9/28	Metalworking	3	2
10/5	Glass	4	3
10/12	Frescos & calcium based art	5	4
10/19	Lecture due to MFA field trip		
10/26	Papermaking	6	
11/2	Dyes and Fibers	7	6
11/9	Pigments	8	7
11/16	Paints and Binders	9	8
11/23	Thanksgiving Holiday – no lab		
11/30	Photography	10	9
12/7	Hang Gallery Show		10