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**ART 180 / CHEMISTRY 180**  
The Art and Science of Early Italian Painting  
Spring, 2000  
MF 12:40-1:40; W 1:00-4:00

*Man is unique not because he does science, and he is unique not because he does art, but because science and art equally are expressions of his marvelous plasticity of mind.*

Jacob Bronowski

**DESCRIPTION:**

This is an interdisciplinary course investigating science and art through the analysis of related themes and experiences. The course will not privilege one method of inquiry over another, nor does it seek to compare or contrast them. Rather, it is the explicit goal to see artistic and scientific inquiry as related expressions of the human mind. The instructors presuppose no more than a general awareness of art history or applied science but we expect a commitment to investigate aspects of both disciplines with equal enthusiasm.

**GOALS:** The goals that you should work towards in this course are:

1. Understanding the composition, structure and properties of some of the chemical substances used in the production of paintings.
2. Understanding how the composition and structure of matter gives rise to its optical properties.
3. Understanding the technique and meaning of medieval painting through a combination of analytical study and the practice of actual technique.
4. Developing an ability to analyze medieval painting within the historical and social context of late medieval and early renaissance art in Italy.

**Texts:**

- A. *The Renaissance Artist at Work: From Pisano to Titian* by Bruce Cole
- B. *The Practice of Tempera Painting: Material and Methods* by Daniel V. Thompson, Jr.
- C. *Essentials of General Chemistry*, 10th ed., by Robinson, Odom, and Holtzclaw.
- D. Additional Readings as assigned.

### **Additional Reading List**

- D-0: Guillem Ramos-Poquí, The Technique of Icon Painting, Harrisburg, PA, 1990 [for reference].
- D-1: “Introduction,” Art in the Making: Italian Painting Before 1400, London, 1992, pp. 1-51.
- D-2: Gardner's Art Through the Ages, 10th edition, New York, 1996.
- D-3: Anabel Thomas, The Painter's Practice in Renaissance Tuscany, Cambridge, 1995 [excerpts].
- D-4: Martin Kemp, The Science of Art: Optical Themes in Western Art from Brunelleschi to Seurat, New Haven, 1990 [excerpts].
- D-5: Ken Shulman, Anatomy of a Restoration: the Brancacci Chapel, New York, 1991 [excerpts].
- D-6: David Rosand, "The Conditions of Painting in Renaissance Venice," Painting in Cinquecento Venice, New Haven, 1982, 1-46.
- D-7: Gianluigi Colalucci, "The Technique of the Sistine Ceiling Frescoes," The Sistine Chapel: A Glorious Restoration, New York, 1992.
- D-8: Loren Partridge, Michelangelo, the Last Judgment: A Glorious Restoration, New York, 1997 [excerpts].
- D-9: Thomas Brill, “Why Objects Appear as They Do” *Journal of Chemical Education*, **1980**, 57 (4), 259-263.
- D-10: Mary Virginia Orna, “Chemistry and Artists’ Colors: Part I. Light and Color” *Journal of Chemical Education*, **1980**, 57 (4), 256-258.
- D-11: Mary Virginia Orna, “Chemistry and Artists’ Colors: Part II. Structural Features of Colored Compounds” *Journal of Chemical Education*, **1980**, 57 (4), 264-267.

**EVALUATION:** There will be three examinations and one comprehensive final examination during the semester. Each of these will count 200 points. In addition, the quality of your panel will count 200 points. The total number of points you attained on these five graded assignments determines your final grade.

| <u>Grade</u> | <u>Total points</u> |
|--------------|---------------------|
| A- / A       | 900-1000            |
| B- / B / B+  | 800-899             |
| C- / C / C+  | 700-799             |
| D- / D / D+  | 600-699             |
| F            | below 600           |

**POLICIES:** Our expectation is that you will attend all classes unless directed otherwise. There will be regularly assigned readings and problem sets and we expect that you will complete these assignments in a timely manner. None of these assignments are graded; they are for your benefit only. These assignments are the minimum we believe is necessary for an average student to understand the subject material. If you are unable to attend a class, it is your responsibility to obtain all material discussed and assignments given.

You will be allowed to make up a missed exam with an excused absence. If at all possible, please let either Dr. Coonin or Dr. Pendley know ahead of time if you are not able to take an exam at its scheduled time so that we can arrange another time for you to take it. If the absence is not excused, you will receive zero points for the exam. Your exams and other work specified must be pledged to be your own.

## Schedule of Classes

| <u>Day</u> | <u>date</u> | <u>Topic(s)</u>  | <u>Reading</u>         |
|------------|-------------|--|------------------------|
| W          | 1/12        | class introduction, expectations,<br>overview of Medieval painting technique<br>check in, make size (studio) | D-1<br>B. chap I,II    |
| F          | 1/14        | apply linen (studio)   | B. chap.               |
| W          | 1/19        | Dalton's Atomic Theory; gesso panel (studio)   | C. chap. 2; B. chap II |
| F          | 1/21        | atomic structure   | C. chap. 2, 5          |
| M          | 1/24        | What is painting? An overview of techniques<br>from Pre-history to the Renaissance.                          | D-2                    |
| W          | 1/26        | Types of Early Italian Painting; scraping panel<br>Brooks Museum Visit                                       | D-1<br>A. pp 137-197   |
| F          | 1/28        | compounds-naming and formulas  | C. chap. 2             |
| M          | 1/31        | The Art of Giotto and His Followers  |                        |
| W          | 2/2         | transfer picture, apply bole (studio/lab)  | B. chap III, IV        |
| F          | 2/4         | chemical bonding   | C. chap. 6             |
| M          | 2/7         | chemical bonding   | C. chap. 6             |
| W          | 2/9         | The Art of Giotto and His Followers; gild (studio)   | B. chap. IV            |
| F          | 2/11        | The Art of Duccio and Siena  |                        |
| M          | 2/14        | <b>EXAM I (200 points)</b>   |                        |
| W          | 2/16        | paint (studio)   | B. chap. V, VI         |
| F          | 2/18        | nature of light; interaction of light with matter  | C. chap.; 5 D-9        |
| M          | 2/21        | The Medieval and Renaissance Workshop  | A. pp.13-58; D-3       |
| W          | 2/23        | absorption of light, color; catch-up (studio)  | D-10, D-11             |
| F          | 2/25        | absorption of light, color   | D-10, D-11             |
| M          | 2/28        | materials of the artist(painting and sculpture)  | A. pp.57-136           |
| W          | 3/1         | paint (studio)   |                        |
| F          | 3/3         | absorption of light, color   | D-10, D-11             |
| M          | 3/13        | Brunelleschi, Alberti, and Perspective   | D-4                    |
| W          | 3/15        | paint (studio)   |                        |
| F          | 3/17        | perception of color  | D-10, D-11             |
| M          | 3/20        | Masaccio   | D-5                    |
| W          | 3/22        | paint (studio)   |                        |
| F          | 3/24        | <b>EXAM II (200 points)</b>  |                        |
| M          | 3/27        | Leonardo da Vinci  |                        |
| W          | 3/29        | paint (studio)   |                        |
| F          | 3/31        | Venice and the Introduction of Oil to Italy  | D-6                    |
| M          | 4/3         | intermolecular forces  | C. chap. 11            |
| W          | 4/5         | paint (studio)   |                        |
| F          | 4/7         | solutions, suspensions, emulsions  | C. chap. 12            |
| M          | 4/10        | solutions, suspensions, emulsions  | C. chap. 12            |
| W          | 4/12        | paint (studio)   |                        |
| M          | 4/17        | Titian and the social world of the artist  |                        |
| W          | 4/19        | <b>EXAM III (200 points)</b>   |                        |
| M          | 4/24        | Michelangelo   | D-7                    |
| W          | 4/26        | check out (studio)   |                        |
| F          | 4/28        | review   |                        |