

Visualizing Science in the Modern World

ARTH 471 sec 001 / ARTH 599 sec 003

Mon. 4:30 – 7:10 pm • Music Theatre Building 1008

Dr. Vanessa M. Schulman
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Office Hours: Wed. 10:00 – 11:45 am or by appt.
Office: Robinson-B 340

ARTH 471 Course Information:

3 credit hours. Studies a particular area of American art, focusing on a form, such as landscape or genre painting; theme, such as nationalism, regionalism, or iconography of the family; or movement, such as American modernism. May not be repeated for credit. Recommended prerequisites: ENGL 302/ENGH 302 and 6 credits in Art History at the 300-level. Writing intensive in the major.

ARTH 599 Course Information:

3 credit hours. Special topics in art history and the decorative arts. May be repeated for credit when topic is different. May be repeated within the term.

Description: This seminar examines the theme of visualizing science in the modern world. It will cover Western Europe and the United States, examining the ways that art and artists have represented the scientific field, as well as the ways that optical instruments, scientific theories, and technologies for discovery and knowledge-making have impacted traditional forms of art-making. Beginning with early modern Europe and concluding with post-World War II artistic movements in the United States, the course will examine linkages between art and science through a variety of lenses. Topics will include alchemy, optics, cartography, photographic experimentation, scientific theories of race and gender, popular psychology, and more.

Goals: By participating in this course, students should meet the following goals:

- develop awareness of the history of science in its historical and artistic contexts
- synthesize information to articulate critical responses to objects and texts
- analyze and evaluate primary and secondary texts
- develop skills of academic communication, both written and oral

Class Communication: The best way to reach me is by email at vschulma@gmu.edu. Please allow up to 48 hours for a response. I will send important reminders to your GMU email, so be sure you check that account or have your mail forwarded to an account you check regularly.

Readings: Readings will be made available as PDFs or links on Blackboard. Readings should be completed before the class meeting for which they are listed. This is a reading-intensive course.

Evaluation of Student Work: I use the following measurements of student performance. All assignments will be graded using a 100-point scale.

A+ (98-100)	A (93-97)	A- (90-92)	Clearly stands out as excellent performance
B+ (87-89)	B (83-86)	B- (80-82)	Level of work is good to very good
C+ (77-79)	C (73-76)	C- (70-72)	Level of work is satisfactory to average
D (60-69)			Work is below average and marginally acceptable
F (below 60)			Quality and/or quantity of work is unacceptable

Writing Intensive in the Major: This course fulfills all or in part the writing-intensive requirement for the Art History major. Among other requirements, writing intensive courses are ones in which:

- students revise at least one substantive assignment
- students receive instructor feedback on their writing
- writing assignments count substantially toward final grades
- writing assignments combine to a total of at least 3500 words (see assignments below)

Grading for Graduate Students		Grading for Undergraduate Students	
Participation	5%	Participation	5%
Weekly Questions	15%	Weekly Questions	15%
Short Papers (2)	30%	Short Papers (3)	45%
Timeline Project	35%	Timeline Project	35%
Discussion Leader w/ Summary Paper	15%		

Participation (5%): Participation starts at a B minus (80/100), but when you participate, that will quickly go up. You can use electronics, but please don't text, post on Instagram, stream video, etc. Missing more than three classes without excuse will result in a zero for participation.

Weekly Questions (15%): For each class meeting, bring at least 3-4 substantive questions about the readings. Questions could address issues you want to discuss in more detail, disagreed with, or were not sure about. Questions are graded by completion except in case of egregious lack of effort.

Short Papers (15% each): Papers based on specific course topics or activities, about 3 double-spaced pages or 750 words each. Undergrads will write three papers and grad students will write two. Papers due Friday 9/14; Friday 9/28; and Friday 10/19. Use Blackboard to view prompts and submit.

Timeline Project: (35%): Each student will select a topic from the histories of science and art. A list of suggestions is attached, but you can explore other options. You will create a media-rich timeline exploring your topic. It will consist of at least 10 slides, each with a caption of 150 words, for a total of 1500 words. The project is due by 11:59 PM on Friday 12/7. Full instructions on Blackboard.

There are multiple steps to keep you on track. For each milestone you miss, 10 points will be deducted from your project grade. The important dates to remember are:

- Proposal with bibliography: due Friday 10/26
- Draft check-in: due Monday 11/12
- Peer editing intensive session in class: Monday 11/26
- Final celebration and presentation of projects in class: Monday 12/3

Discussion Leader (15%): Graduate students only. Choose a day to lead discussion. You are expected to read an additional text (listed on the course calendar below) and present it to the class. Please prepare an oral presentation of about 20 minutes covering the main points of the reading (this can be informal, but if you discuss images you should have slides); a handout for the class with an outline of the reading and 3-4 questions for discussion; and a 3-page summary response paper.

Late work will be penalized 5 points for each day past the due date. All assignments are due at 11:59 PM on the due date, after which they are considered one day late. Extensions will be granted *if deemed appropriate* when students submit a request in writing at least one week before the due date.

Academic Honesty: Academic dishonesty constitutes a serious violation of your learning process and your social contract with other students. Academic dishonesty includes, but is not limited to:

- failure to cite sources for quotations and ideas
- cutting and pasting text from other sources
- passing off another's work as your own
- purchasing or copying a paper found online
- reusing a paper you wrote for another course

I have a **zero tolerance** policy for academic dishonesty, whether intentional or not. Students who violate standards of academic honesty will earn a **zero** for the assignment and may risk failing the course or being subject to disciplinary action. More information, including definitions of cheating, lying, and plagiarism, can be found at the Office of Academic Integrity website at oai.gmu.edu.

Support Resources for Students

Students with Disabilities: Students with disabilities are entitled to request appropriate accommodations. Students should first register with Disability Services and then bring me the provided letter to receive the necessary accommodations. ds.gmu.edu, or call (703) 993-2474.

Help with Writing: If you have struggled with writing in the past, or if English is not your first language, you may want to seek help from the Writing Center. They offer one-on-one tutoring and workshops throughout the semester. Robinson-A, Room 114, or writingcenter.gmu.edu

Emotional and Mental Support: College life is complicated. Students may find it helpful to talk with a professional. Counseling and Psychological Services (CAPS) can help address both personal and academic concerns. Services are free and confidential. SUB I, Room 3129, or caps.gmu.edu

LGBTQ Resources: LGBTQ Resources “works to promote the academic success, health and well-being of lesbian, gay, bisexual, transgender, and queer students and their allies.” SUB I, Room 2200, or lgbtq.gmu.edu

Diversity: The Office of Diversity, Inclusion, and Multicultural Education provides support for an inclusive campus, including first-generation and undocumented students. odime.gmu.edu

Bereavement: Students dealing with loss are encouraged to speak with the Dean of Student Academic Life for their College. The Dean's office can help you contact your professors and deal with academic challenges of bereavement. CHSS students contact chssdean@gmu.edu. Contacts for other Colleges are at: registrar.gmu.edu/students/academic-standing/deans-and-directors/

Course Calendar

Week 1

Mon. 8/27 Course Introduction

Week 2

Mon. 9/3 NO CLASS: Labor Day

Visit one of the following: Walters Museum Chamber of Wonders; R. Luke DuBois exhibit (National Academy of Sciences); Library of Congress map and exploration galleries; Trevor Paglen exhibit (Smithsonian American Art Museum); Water, Wind and Weaves in the Dutch Golden Age exhibit (National Gallery); The Art of Burning Man exhibit (Renwick Gallery); National Museum of Health and Medicine; Animal Inside Out exhibit (VA Science Museum—closes Sept. 3)

Week 3

Mon. 9/10 Astronomy: The Birth of Modern Science?

READINGS:

- Samuel Y. Edgerton, "Galileo, Florentine 'Disegno,' and the 'Strange Spottednesse' of the Moon," *Art Journal* 44 (Sep. 1984): 225-232.
- Amy Powell, "Squaring the Circle: The Telescopic View in Early Modern Landscapes," *Art History* 39, no. 2 (Apr. 2016): 283-301.
- Giulia Martina Weston, "After Galileo: The Image of Science in Niccolò Torrioli's *Astronomers*," *Art History* 39, no. 2 (Apr. 2016): 303-317.
- Grad student presentation: Filippo Camerota, "Looking for an Artificial Eye: On the Borderline between Painting and Topography," *Early Science and Medicine* 10, no. 2 (2005): 263-285.

DUE:

Short Paper #1 (by 11:59 PM on Friday 9/14)

Week 4

Mon. 9/17 Cartography and Curiosity Cabinets: Collecting the World
** Meet in Special Collections Research Center, Fenwick Library, Room 2400 **

READINGS:

- William Boelhower, "Inventing America: The Culture of the Map," *French Review of American Studies* 36 (Apr. 1988): 211-224.
- Brooke Belisle, "Nature at a Glance: Immersive Maps from Panoramic to Digital," *Early Popular Visual Culture* 13, no. 4 (2015): 323-335.
- Grad student presentation: Paula Findlen, "Inventing Nature: Commerce, Art, and Science in the Early Modern Cabinet of Curiosities," in Pamela H. Smith and Findlen, eds., *Merchants and Marvels: Commerce, Science, and Art in Early Modern Europe* (Routledge, 2002): 297-323.

Week 5

Mon. 9/24 Experimentation, Demonstration, and Spectacle

READINGS:

- Paul Duro, "Great and Noble Ideas of the Moral Kind: Wright of Derby and the Scientific Sublime," *Art History* 33, no. 4 (Sept. 2010): 661-679.
- James Delbourgo, *A Most Amazing Scene of Wonders: Electricity and Enlightenment in Early America*, chapter 3 (Harvard, 2004).
- Grad student presentation: Ann Bermingham, "Technologies of Illusion: De Louthembourg's Eidophusikon in Eighteenth-Century London," *Art History* 39, no. 2 (Apr. 2016): 376-399.

DUE:

Short Paper #2 (by 11:59 PM on Friday 9/28)

Week 6

Mon. 10/1 Alchemy to Chemistry: The Science of Colors

READINGS:

- David Bjelajac, "Mercurial Pigments and the Alchemy of John Singleton Copley's *Watson and the Shark*," in Anne Collins Goodyear and Margaret A. Weitekamp, eds., *Analyzing Art and Aesthetics, Artefacts*, vol. 9 (Smithsonian, 2013), 144-166.
- Barbara Whitney Keyser, "Science and Sensibility: Chemistry and the Aesthetics of Color in the Early Nineteenth Century," *Color Research and Application* 21, no. 3 (June 1996): 169-179.
- Philip Ball, *Bright Earth: Art and the Invention of Color*, chapter 8 (Chicago, 2003).
- Grad student presentation: Georges Roque, "Chevreul and Impressionism: A Reappraisal," *Art Bulletin* 78, no. 1 (March 1996): 26-39.

Week 7

Mon. 10/8 NO CLASS: I am out of town at a conference

Week 8

Mon. 10/15 Optical Devices

READINGS:

- Sarah Kate Gillespie, "John William Draper and the Reception of Early Scientific Photography," *History of Photography* 36, no. 3 (Aug. 2012): 241-254.
- Frances Terpak, "Microscopes," "Mirrors," and "Magic Lantern," in Barbara Maria Stafford and Frances Terpak, *Devices of Wonder: From the World in a Box to Images on a Screen* (Getty, 2001), 205-214, 256-265, 297-306.
- Grad student presentation: Jenny Carson and Ann Shafer, "West, Copley, and the Camera Obscura," *American Art* 22, no. 2 (Summer 2008): 24-41.

DUE:

[undergrads only] Short Paper #3 (by 11:59 PM on Friday 10/19)

Week 9

Mon. 10/22 ** Meet in Fenwick Library **Room TBA** for research session with Stephanie Grimm

DUE:

Proposal for final project (by 11:59 PM on Friday 10/26)

Week 10

Mon. 10/29 Botany and Zoology

READINGS:

- Michael Gaudio, "Swallowing the Evidence: William Bartram and the Limits of Enlightenment," *Winterthur Portfolio* 36, no. 1 (Apr. 2001): 1-17.
- Julia Voss, "Monkeys, Apes and Evolutionary Theory: From Human Descent to King Kong," in Diana Donald and Jane Munro, eds., *Endless Forms: Charles Darwin, Natural Science and the Visual Arts* (Yale, 2009), 215-234.
- Grad student presentation: Philip Kerrigan, "Marianne North: Painting a Darwinian Vision," *Visual Culture in Britain* 11, no. 1 (March 2010): 1-24.

Week 11

Mon. 11/5 Geology and Landscape

READINGS:

- Nina Amstutz, "Caspar David Friedrich and the Anatomy of Nature," *Art History* 37, no. 3 (June 2014): 454-481.
- Rebecca Bedell, "The History of the Earth: Darwin, Geology and Landscape Art," in Diana Donald and Jane Munro, eds., *Endless Forms: Charles Darwin, Natural Science and the Visual Arts* (Yale, 2009), 49-79.
- Jason Weems, "Stratifying the West: Clarence King, Timothy O'Sullivan, and History," *American Art* 29, no. 2 (Summer 2015): 34-41.
- Grad student presentation: Alan Wallach, "Making a Picture of the View from Mount Holyoke," in David C. Miller, ed., *American Iconology: New Approaches to Nineteenth-Century Art and Literature* (Yale, 1995), 80-91.

Week 12

Mon. 11/12 The Racialized and Gendered Body

READINGS:

- Bridget Goodbody, "'The Present Opprobrium of Surgery': *The Agnew Clinic* and Nineteenth-Century Representations of Cancerous Female Breasts," *American Art* 8, no. 1 (Winter 1994): 32-51.
- Samantha Burton, "Champagne in the Shrubbery: Sex, Science, and Space in James Tissot's London Conservatory," *Victorian Studies* 57, no. 3 (Spring 2015): 476-489.
- Elizabeth Edwards, "Evolving Images: Photography, Race and Popular Darwinism," in Diana Donald and Jane Munro, eds., *Endless Forms: Charles Darwin, Natural Science and the Visual Arts* (Yale, 2009), 167-193.
- Grad student presentation: Elizabeth K. Menon, "Anatomy of a Motif: The Fetus in Late 19th-Century Graphic Art," *Nineteenth-Century Art Worldwide* 3 (Spring 2004).

DUE: Draft check-in. Submit your rough draft (it does not matter how short/long!)

Week 13

Mon. 11/19 Spiritualism and the Irrational

READINGS:

- Tessel M. Bauduin, "Science, Occultism, and the Art of the Avant-Garde in the Early Twentieth Century," *Journal of Religion in Europe* 5, no. 1 (Jan. 2012): 23-55.
- Kirsten A. Hoving, "The Surreal Science of Soap: Joseph Cornell's First 'Soap Bubble Set,'" *American Art* 20, no. 1 (Spring 2006): 14-35.
- Louis Kaplan, "Where the Paranoid Meets the Paranormal: Speculations on Spirit Photography," *Art Journal* 62, no. 3 (Sept. 2003): 18-27.
- Grad student presentation: Jonathan Shirland, "Embyronic Phantoms: Materiality, Marginality, and Modernity in Whistler's Black Portraits," *Art History* 34, no. 1 (Feb. 2011): 80-101.

Week 14

Mon. 11/26 Anxiety: Pop Psychology to the Rescue
Intensive Peer Review Boot Camp!

READINGS:

- Timothy J. Garvey, "Laszlo Moholy-Nagy and Atomic Ambivalence in Postwar Chicago," *American Art* 14, no. 3 (Fall 2000): 22-39.
- Michael Leja, "Jackson Pollock: Representing the Unconscious," in Marianne Doezema and Elizabeth Milroy, eds., *Reading American Art* (Yale, 1992), 442-464.

BRING/DUE:

Bring two hard copies of your draft to class for peer review and submit a copy to me on Blackboard.

Week 15

Mon. 12/3 Final Celebration and Presentation of Projects to the Class

DUE: Final timeline project (by 11:59 PM on Friday 12/7)

List of Possible Topics for Projects

I have brainstormed an extensive list of possible projects for the timeline project. However, I am open to many additional possibilities. You are also welcome to extend your inquiry into the later twentieth century or the present.

Individual Artists

Benjamin West
Charles Burchfield
Charles Sheeler
Eadweard Muybridge
Frederic Edwin Church
George Stubbs
Georges Seurat
Jackson Pollock
Jacques Daguerre
John Brett
John Singleton Copley
Joseph Cornell
Joseph Stella
Joseph Wright of Derby
Joshua Reynolds
Lazslo Moholy-Nagy
Marcel Duchamp
Max Ernst
Odilon Redon
Paul Klee
Philip Jacques de
Louthembourg
Robert Rauschenberg
Samuel F. B. Morse
Thomas Cole
Thomas Eakins
Thomas Edison
Vincent van Gogh
Walter Sickert
William Henry Fox Talbot
Winslow Homer

Scientific Fields

Aerodynamics
Alchemy
Anatomy
Anesthesiology
Audiology
Chemistry
Codes and Ciphers
Comparative Anatomy
Craniometrics
Criminology
Cybernetics
Dactylography
Ecology
Electricity
Embryology
Ergonomics
Eugenics
Evolutionary Theory
Galvanism
Geology
Magnetism
Medicine/Surgery
Mesmerism
Meteorology
Natural History Illustration
Pathology
Phrenology
Physics
Surgery
Telegraphy
Zoology

Technologies

3D Glasses
Camera Lucida
Camera Obscura
Cinema
Electric Lighting
Kinetoscope
Microscope
Moving Images
Photographic Apparatuses
Stereograph
Telegraph
Telephone
Telescope
Transportation (train, car, airplane)
X-Ray
Zoopraxiscope

Thematic Issues

Color Theory
Display of Remains or Specimens
Gender Issues
Mental Illness/Diagnosing Artists
Race in Art
Science as Entertainment
Scientific Education
Social Darwinism/Survival of the Fittest
Surveillance, Identification, and Monitoring