ART AND CHEMISTRY
A course proposal submitted by Maura Lyons, Associate Professor, Department of Art and Design, and Mark Vitha, Professor, Department of Chemistry

Description of the course to be offered
The course we are developing is designed to enhance students’ artistic literacy in the context of critical inquiries in the disciplines of art history and chemistry. Students will study artworks such as the paintings of Vermeer and Rothko, examining them through the lens of art historical studies informed by chemical analyses. Importantly, this course will also include a laboratory component in which students gain hands-on experience with chemical analysis techniques. In this way, the course takes a multiple-perspectives approach, similar in spirit to that offered by the Paths to Knowledge courses in Drake’s Honors Program, but it will be open to all students in all majors without prerequisites.

The course will originally be offered during J-term and team-taught by Professor Maura Lyons of the Department of Art and Design and Professor Mark Vitha of the Department of Chemistry. A case study that we intend to use in the course provides a sense of how artworks, art history, the humanities, and chemistry will be integrated. Students in the course will read about and discuss the social, historical, and geopolitical significance of the use of red pigments in 16th and 17th European paintings, as seen in the Rembrandt painting in Figure 1. It was notoriously difficult to make red paints that did not fade or discolor over time. When the Spanish conquered South America, they created a monopoly on the trade of a red pigment derived from cochineal beetles (Figure 2) harvested from the nopal cactus plant. Thus, the use of red pigments in paintings, such as those seen in Velasquez’ Las Meninas (Figure 3), had overtones of empire and world conquest. Students will explore various aspects of the development of the cochineal trade as well as its chemical properties, as described below.

Through such case studies, combined with lectures, discussions, hands-on laboratory experiments, and visits to local art restoration projects, students will practice the working methods of art history and chemistry. These include visual and iconographic analysis and historical inquiry into factors such as patronage, artistic biography, materials and methods used in creating artworks, and the historical circumstances in which works were created. In the laboratory, students will experience how analytical methods of chemical analysis such as UV-visible and infrared spectroscopy provide qualitative and quantitative information about the behavior of molecules.

Topics to be explored
Through the integration of these disciplinary approaches, students will ultimately come to know the ways that art historical critical inquiries guide studies and improve our understanding and appreciation of artworks, how chemistry can be applied to assist and in some cases direct historical studies, and how the two disciplines working together contribute to...
new understanding and new areas of exploration. Students will also step back to think critically about the ethics involved in the use of art historical and chemical analyses in establishing standards of monetary, aesthetic, and cultural value for artworks. Specifically, topics to be studied include

- Materials and processes used in art making, with a primary emphasis on painting,
- Authentication, restoration, and conservation of art,
- The ethics of authentication, restoration, and conservation practices, and
- The historical circumstances during which specific artworks were created.

Course activities

In addition to its grounding in texts and articles drawn from art historical and conservation journals, we will teach our course using many high impact teaching and learning practices, including historical and contemporary case studies, class discussions, hands-on laboratory activities, visits to museums and historical buildings to see and interact with the results of restoration and conservation projects, and visits from professionals in those areas.

Case studies for the course include the historical and chemical analyses that have been done on the fading of Rothko paintings arising from the materials he used, the recent exposure of Wolfgang Beltracchi as a forger of hundreds of paintings said to be by Ernst, Leger, Campendonk, and van Dongen caused by his use of a paint that was not historically available at the time a particular painting was said to have been created, the conservation of Jackson Pollock’s Mural (Figure 4) owned by the University of Iowa Museum, the analysis of van Dyck’s St. Rosalie Interceding for the Plague-stricken of Palermo, and other studies of authentication, restoration, and conservation.

In addition to these case studies, we will make active use of local resources in order to connect the material students are studying to concrete examples. Possible field trips include 1) the Iowa State Capitol Building to see the restored murals and mosaics, 2) the World Food Prize Building to see the restored WPA murals, and 3) the new University of Iowa Art Museum to see the Jackson Pollock mural (hopefully reopened by January, 2015). We intend to arrange tours of these facilities with people who can speak to the murals’ restoration and preservation.

Laboratory experiments will be designed in which students use chemical instruments to analyze paints and pigments. For example, students will extract the pigment that makes cochineal beetles red and examine the extract using UV-visible spectroscopy. From such an examination, students will learn about chemical analysis and specifically about the absorption of light by molecules that results in the colors that we perceive. This particular lab clearly has direct links to the cochineal case study discussed above.

We also intend to have Dr. Julie Arslanoglu, an associate research scientist at the Metropolitan Museum of Art, or Professor Erich Uffelman, an expert on Dutch art restoration and conservation at Washington and Lee University, guest lecture in the class, either in person or through video conferencing. In this way, students in the class will interact with and ask questions of people who have worked in museum conservation laboratories around the world.
Readings and artifacts

A list of potential readings is attached to this proposal. Regarding artifacts to be examined, students will create a painting that includes an underdrawing, layers of paint, and lastly a layer of varnish. An infrared camera will be used to show how infrared analysis can contribute to an understanding of the artist’s process in creating art. We also hope to do the same analysis with paintings obtained from art students or from garage sales or thrift stores where what will be revealed is truly unknown. This experiment will be linked to a case study of Van Dyck’s St. Rosalie Interceding for the Plague-stricken of Palermo (Figure 5). As part of its art historical analysis, scientific examination of the painting revealed an unexpected self-portrait of the artist inverted relative to the main image (Figure 6). Historically, this suggests that the artist was reusing canvases, the necessity of which may have been driven by the plague epidemic and the concomitant quarantine of Palermo, making it difficult to obtain new art supplies.

Additional examples of artifacts paired with specific case studies will be used throughout the course. For example, infrared spectroscopy has been used to study varnishes and oils used in paintings (see Figure 7). Such investigations are possible with instruments available in the chemistry department. Varnishes play an important role in the vibrancy we perceive in paintings, but they also yellow and crack as they age. A specific case study of the importance of varnish analysis – both from an historical and chemical perspective – involves the restoration of Vermeer’s View of Delft (Figure 8). A conservator in 1956 deliberately added a yellow tinge to varnish that he applied to the painting, thinking that Vermeer desired the painting to have a more somber tone. Subsequent analysis and scholarship has revealed that this was a mistaken idea and that the yellowing was a consequence of aging. Thus, the 1994 restoration of the painting restored the painting to its original, vibrant color. The difference between the old varnish and where it has been removed can be seen quite clearly in Figure 8.

Distinguishing student outcome and pedagogical features

The student outcomes of this course are unique because it is the first course at Drake that we know of that integrates art, art history, and chemistry. To our knowledge, it will also be the first course in the humanities that integrates a laboratory component. Thus, students will learn about notable artworks, art making, critical inquiry in art history, inquiry in the sciences, and how all of these contribute to answering questions of historical significance, authenticity, restoration, and conservation, as well as to establishing value within the art market. Specific outcomes include:

1) Recognition of artwork by Rembrandt, Vermeer, Van Dyck, Rothko, and Pollock.
2) Development of the skills required to conduct literature studies in the area of art history, restoration, and/or conservation.

3) An ability to articulate examples in which art historical questions motivated specific scientific examination of an artwork.

4) An ability to articulate examples in which chemical findings motivated specific art historical scholarship.

5) A familiarity with some of the chemical analysis methods used to examine paintings.

The fact that the course will be team taught by an art historian and chemist is a distinguishing feature because students will be introduced to the ways professionals in both disciplines approach questions related to art. In this way, the course resembles the successful model that Professor Angela Battle has used in some projects in which science and humanities students react to each other’s work, or to the work of professors from different disciplines. These projects have proven to be popular and have attracted broad interest across campus. As mentioned above, the course also mimics the Paths to Knowledge approach in that multiple perspectives are brought to bear on a particular topic. Thus, the groundwork is laid for such a course, yet the course is unique in its bridging of art, art history, and chemistry and will be open to all students at all levels.

**Timeline**

The topic lends itself to the brief but intense investigative period of J-term. The fluidity of the classroom time throughout the week allows for a seamless integration of in-class, laboratory, and extra-campus activities with fewer scheduling restrictions than might typically be encountered during the regular semester. Similar courses are offered at other institutions in such a setting, so the model has already proven to be successful.

While the call for proposals encourages “the creation of courses to be offered in 2014-2015,” given the interdisciplinary nature of the course, and that both instructors are on sabbatical for 2014-2015, the first real opportunity for offering the course is January, 2016. However, our sabbaticals provide the perfect time to fully develop the course ideas, plan tours to the State Capitol, the World Food Prize Building, and other locations, and discuss class visits with our contacts at the Metropolitan Museum of Art and Washington and Lee University.

For the first offering, we will use ‘special topics’ course numbers within our respective departments to offer the cross-listed course. We will naturally process the course through the appropriate J-term planning and oversight committees. Because we intend for the course to be counted as an ‘artistic experience’ AOI, we will also submit it to the University Curriculum Committee during the 2014-2015 academic year so that it is “on the books” in time for January, 2016. Again, being on sabbatical will allow time for these applications so that everything is in place for the first offering. Before offering the course a second time, we will seek course approval for regular department numbers as required by the College of Arts and Sciences.

**How the proposed course fits the goals of the department, college, and community**

Drake recently became a STEM (science, technology, engineering, and math) hub in the state of Iowa, and chemistry certainly fits in with this new-found curricular emphasis. At the University level, President Maxwell frequently states that at Drake, the ‘E’ stands for
‘education.’ We believe that this course will be valuable to art and science education majors who are looking for ways to integrate science and art into their teaching.

At the college level, Dean Lenz, correctly in our opinion, has expressed the desirability of altering ‘STEM’ to ‘STEAM’, where the ‘A’ adds an arts (both liberal and fine) dimension to the education of science students. This course certainly does that, and thus fits with the goals of the college. Furthermore, we hope to find mechanisms by which enrollment could be managed such that humanities and science students are roughly equally represented, thereby enhancing the interdisciplinary insights and intellectual exchanges we intend to offer our students.

**Addressing the selection criteria**

**The integration of art with the humanities**

Arts and humanities are strongly integrated in this course, as artworks are the objects of study and humanistic methods of inquiry are used to critically examine questions related to them. While it may seem unusual to link chemistry to the humanities, given its roots in natural philosophy, chemistry certainly fits within the realm of liberal arts and thus contributes to the spirit of the creation of courses that bridge art with the humanities and liberal studies.

The course will foster critical inquiry by requiring students to see overlaps between disciplines that many may perceive as separate and unrelated. It will also be grounded in the questions of what art history can learn from chemical studies of artworks, and how knowledge of art history can guide chemical inquiries. In this way, the course is centered on the theories of art history and chemistry while the laboratory and extra-campus activities examine the practical application of these theories.

**Viability**

The co-instructors of the course attended a week-long workshop on the topic of “Art and Chemistry” sponsored by the National Science Foundation (NSF). The workshop was led by three faculty members from small, liberal arts institutions. In its 20+ year history, the workshop has spawned dozens of “art and chemistry” courses at institutions across the country. Thus, we know such courses can succeed and be popular at institutions like Drake. Furthermore, a treasure trove of readings, personal contacts, course materials, and laboratory experiments are readily available to us through our participation in that workshop. The question will not be ‘what to teach’ but ‘what not to teach.’ Both instructors have also taught Paths to Knowledge and are thus experienced with team teaching interdisciplinary courses.

With such resources and experience at hand, the probability of a viable, sustained, and well-received course is quite high. Furthermore, such resources make it possible that once the course is established, other faculty can step in and teach it, contributing their own disciplinary aspects, allowing the course to grow and develop organically. For example, one can imagine an offering in which materials used in African art is emphasized, as several faculty members in the Department of Art and Design have expertise in this area. Or perhaps a different chemist would focus on the synthesis of dyes and pigments, rather than their analysis. The variations of “art and chemistry” courses across the country attest to the fact that the course topic is malleable, while always preserving an interdisciplinary approach to art, art history, and science.
Lastly, it is conceivable that this course could develop into one that is taught during the regular semester depending on resources and faculty availability.

**Likelihood of achieving student goals**

As noted previously, our participation in the NSF workshop, our disciplinary backgrounds, our experience with team-teaching interdisciplinary courses, as well as our personal commitment to liberal arts, make it likely that we will achieve our student learning goals of integrating critical studies in art, art history, and chemistry. More generally, as noted above, courses of this nature have been highly successful and well received across the country, which is why the NSF continues to support and expand the workshop offerings on the topic.

**Distinction between proposed courses and existing courses**

As stated above, we simply do not know of any course at Drake that incorporates art, art history, and chemistry, involves students in case studies integrating these disciplines, and includes a laboratory experience grounded in fundamental chemical principles of analysis.

**Innovative, high impact strategies for teaching and learning**

Ultimately, critical thinking and problem solving underpins the course we will offer. Students will develop skills in identifying what questions to ask about artworks and what resources and methods to use in answering those questions. These skills will be developed using high-impact teaching and learning practices, including

- Co-teaching that offers multi-disciplinary perspectives,
- Case studies that engage students in well-known examples of art authentication and restoration, including their ethical implications,
- Visits from experts in the field of art analysis,
- Tours of local restoration projects led by people with intimate knowledge of the projects, and
- Integration of lecture, discussions, and hands-on lab work that bring concepts to practice and relate back to case studies.

**Summary**

The course we envision integrates artistic literacy with critical inquiry in the humanities and science through interdisciplinary studies of historical and modern artworks using the tools of art historical and chemical analyses. Underpinning this course is the goal of fostering student curiosity and critical, analytical problem solving skills through high impact teaching and learning methods. It is unlike any other course at Drake in its multi-disciplinary, hands-on approach. Based on the response to similar courses around the country and informal discussions with current Drake students, we are confident the topic appeals to a broad audience. Given our scholarly backgrounds and participation in the NSF workshop, we have the disciplinary and interdisciplinary expertise and resources required for this particular course. We also have experience team-teaching interdisciplinary courses. All of these factors combine to make it highly probably that we will develop and offer a highly successful course that simultaneously meets the goals of the Ralph and Sylvia Green Foundation, the Center for the Humanities, and our students.
Suggested Readings

General Sources


Conservation and Authentication Sources


Ethics Sources


Films

MAURA LYONS
Dept. of Art & Design, Drake University
2507 University Avenue
Des Moines, IA 50311-4505
515.271.3858
maura.lyons@drake.edu

EDUCATION

BOSTON UNIVERSITY, Boston, MA 1990-1999

GEORGETOWN UNIVERSITY, Washington, DC 1986-1990

TEACHING EXPERIENCE

DRAKE UNIVERSITY, Des Moines, IA 2000-present
Assistant Professor, 2000-2006; Associate Professor, 2006-present. Courses taught include Survey of Art History I and II, Themes in Art History, Introduction to Art (for non-majors), American Art History, American Landscapes, Nineteenth-Century Art, Modern Art History, Art Since 1945, Curatorship Seminar (Architecture of Eliel and Eero Saarinen at Drake University; American Civil War Cartoons from Harper's Weekly), First-Year Seminar, and Paths to Knowledge for Drake Honors program.

UNIVERSITY OF HARTFORD, West Hartford, CT Spring 2000
Instructor. ART 100: Aspects of Art (2 sections of art appreciation course) and discussion sections for ART 211: Introduction to Western Art II.

TRINITY COLLEGE, Hartford, CT Fall 1999
Visiting Lecturer, American Studies Graduate Program. AMST 829: Andy Warhol in Context.

CENTRAL CONNECTICUT STATE UNIVERSITY, New Britain, CT Fall 1999
Instructor. ART 110: Introduction to Western Art History.

UNIVERSITY OF HARTFORD, West Hartford, CT Summer 1999
Instructor. ART 100: Aspects of Art.

ST. JOSEPH COLLEGE, West Hartford, CT Spring 1999

UNIVERSITY OF HARTFORD, West Hartford, CT 1998-1999
Instructor. ART 360: Nineteenth-Century Art: The Landscape (fall) and ART 100: Aspects of Art (spring).
REFEREED PUBLICATIONS


NON-REFEREED PUBLICATIONS


*Building a Modern Campus: Eliel and Eero Saarinen at Drake University*. Anderson Gallery, Drake University, Des Moines, IA, 2008. 11,500-word essay for exhibition catalogue.
CONFERENCE PAPERS AND SYMPOSIA


Midwest Art History Society Annual Conference, Columbus, OH, March 22, 2013. Presented “Civil War Landscapes: The Forgotten Chapter of the American Landscape Tradition?” for session entitled Seeing the Civil War.


Building a Modern Campus: A Public Symposium, Drake University, Des Moines, IA, November 8, 2008. Organized scholarly symposium with four invited speakers to accompany the exhibition *Building a Modern Campus: Eliel and Eero Saarinen at Drake University*. The speakers placed Eliel and Eero Saarinen’s work at Drake University in the context of the Saarinen’s career, modernism in Iowa, the history of Des Moines and the Drake neighborhood, and the recent renovations to the Saarinen buildings at Drake. Program included the keynote speaker, Peter C. Papademetriou, New Jersey Institute of Technology; Jason Alread, Iowa State University and Substance Architecture; Jennifer Irsefeld James, independent scholar; and Dan Sloan, Baldwin White Architects.


Midwest Art History Society Annual Conference, Pittsburgh, PA, April 11, 2003. Presented “Rockwell Kent’s Cold War Landscapes.”


GUEST LECTURES AND PANEL PARTICIPATION


Drake University Center for the Humanities Symposium, Drake University, Des Moines, IA, March 26, 2011. Participant in panel with subject “What is The Humanities?”

Drake University Center for the Humanities Colloquium Series, Drake University, Des Moines, IA, September 24, 2010. Presented “The DaVitha Code, or: How I Learned to Stop Worrying and Love the Chemistry of Art,” with Dr. Mark Vitha, Chemistry Department, Drake University. Also presented version for Torch Club, Des Moines, IA, October 12, 2011.

Drake University Center for the Humanities Colloquium Series, Drake University, Des Moines, IA, October 13, 2006. Presented “Cultivating ‘Our Farm, America’: Rockwell Kent and the Politics of Homeland.”

Des Moines Art Center, Des Moines, IA, April 9, 2006. Presented gallery talk on The Art of Richard Tuttle exhibition with Patricia Hickson, Art Center curator.


Rea Society, Drake University, Des Moines, IA, April 22, 2005. Presented “Saarinen’s Drake University” as a session in a continuing education course on the topic of Des Moines architecture.

Terrace Hill, Des Moines, IA, December 14, 2004. Delivered public lecture “Art Collecting during the Victorian Age: The Case of Terrace Hill.” Part of a year-long lecture series on Victorian culture sponsored by the historic home that serves as the Iowa governor’s mansion.

Anderson Gallery, Drake University, Des Moines, IA, October 8, 2004. Participated in the interdisciplinary faculty panel on the subject of “Imaging Politics” that accompanied the exhibition Looking At/Looking Through: Adelheid Mers and Patrick McGee.

Education Department, Des Moines Art Center, Des Moines, IA, June 12, 2003. One of three panelists for the “Modernism Salon” convened to accompany the exhibition Debating American Modernism: Stieglitz, Duchamp, and the New York Avant-Garde at the Art Center.

Drake University, Des Moines, IA, January 23, 2003. Delivered public lecture entitled “Publish and (Who Will) be Damned?: The Lure of the Art Historical Narrative,” scheduled to coincide with the Department of Art and Design’s biennial faculty exhibition.

Education Department, Des Moines Art Center, Des Moines, IA, June 12, 2002. Presented lecture entitled “Survey of Earthworks” as a preview for the museum’s exhibition featuring the British artist Andy Goldsworthy. Repeated for the Art Center’s docents on October 3, 2002.


PROFESSIONAL DEVELOPMENT WORKSHOPS

Selected as one of thirty participants in “The Visual Culture of the American Civil War,” a National Endowment for the Humanities (NEH) Summer Institute for College and University Teachers, sponsored by The American Social History Project/Center for Media Learning, The Graduate Center, City University of New York, New York, NY, July 9-20, 2012.

Selected as one of twenty participants in “Chemistry of Art” workshop, sponsored by the National Science Foundation (NSF), through the Center for Workshops in Chemical Sciences, Whitman College, Walla Walla, WA, June 20-25, 2010.

GRANTS AND AWARDS


Exhibition Grant, State Historical Society, Inc. Funding in the amount of $4,500 for the exhibition Draw Your Weapons!: Civil War Cartoons from Harper’s Weekly.

Major Grant, Humanities Iowa, 2013. Funding in the amount of $5,000 for the exhibition Draw Your Weapons!: Civil War Cartoons from Harper’s Weekly from the state affiliate of the National Endowment for the Humanities.

Faculty Research Grant, Drake University Office of the Provost, summer and fall 2013.

Faculty development grant, College of Arts and Sciences, Drake University, 2012.

Course reassignment, Beckman Faculty Development Endowment, Drake University Office of the Provost, fall 2012.

Drake University Honors Professor of the Year, 2008-09.

Major Grant, Humanities Iowa, 2008. Funding in the amount of $10,750 for the exhibition Building a Modern Campus: Eliel and Eero Saarinen at Drake University.

Research grant, Drake University Center for the Humanities, 2008.
Friends of Drake Arts, Faculty Advancement Grant, Drake University, 2008.

Drake University Research Grant, 2008-09. Supported student research assistant for the design and production of the website for the exhibition *Building a Modern Campus: Elieel and Eero Saarinen at Drake University*.

Friends of Drake Arts Faculty Advancement Grant, Drake University, 2007.

Friends of Drake Arts Faculty Advancement Grant, Drake University, 2005.

Research travel grant, Drake University Center for the Humanities, 2004.

Research grant for tenure-track faculty, Drake University Center for the Humanities, 2003-2004 (two-course release, Spring 2004).

Friends of Drake Arts Faculty Advancement Grant, Drake University, 2003.

Grant from College of Arts and Sciences Technology Committee, Drake University, allowed technology enhancement of the principal art history classroom, 2002.

Faculty grant to subsidize book illustrations, Drake University Center for the Humanities, 2002.

Friends of Drake Arts Faculty Advancement Grant, Drake University, 2001.


**MUSEUM EXPERIENCE**

**WADSWORTH ATHENEUM**, Hartford, CT         June-November 1999

**WORCESTER ART MUSEUM**, Worcester, MA       Spring 1999
Instructor in Education Department. Taught the first half of a joint art history/studio art course for adults entitled “The Hudson River School: Masters of Atmosphere and Light.” Class designed to accompany traveling exhibition *All that is Glorious Around Us*: *Paintings from the Hudson River School*, March 13-June 27, 1999.

**WADSWORTH ATHENEUM**, Hartford, CT          Fall 1998

**FARNSWORTH ART MUSEUM**, Rockland, ME       1996-1997
Research Assistant. Offered part-time assistance with research and production of permanent collection catalogue. Duties included compiling object checklist and writing artist biographies.

**SOUTH END HISTORICAL SOCIETY**, Boston, MA  Summer 1992, 1993
Research Assistant. Conducted research for exhibition *Down Washington Street: Visions of Past, Present, and Future*, including locating visual images of area in local repositories. Assisted curator in developing checklist and contributed to label text.

**ADDISON GALLERY OF AMERICAN ART,**
Phillips Academy, Andover, MA 1991-1992
*Curatorial Intern.* Conducted library and archival research for entries in a catalogue of the collection. Documented complete provenance, exhibition history, and bibliography on each of the seven works by George Inness owned by museum. Curated a small exhibition drawn from the Addison’s permanent collection.

**WELLESLEY COLLEGE MUSEUM OF ART,**
Wellesley, MA Summer 1991
*Intern.* Assisted registrar in supervising conservation surveys of the painting and sculpture collections. Generated complete survey lists and individual object forms. Completed condition reports and created accession files for newly acquired objects. Performed several small research projects for curatorial staff.

**BOSTON UNIVERSITY ART GALLERY,** Boston, MA 1990-1991

### EXHIBITIONS


*Building a Modern Campus: Eliel and Eero Saarinen at Drake University.* Anderson Gallery, Drake University, Des Moines, IA, November 7-December 19, 2008. Curator. Organized exhibition and accompanying programming, including symposium and website (buildingamoderncampus.com), and wrote catalogue essay. Involved three classes at Drake University in producing the exhibition.


SELECTED INSTITUTIONAL SERVICE

DRAKE UNIVERSITY, Des Moines, IA

Interim Chair, Department of Art and Design (spring 2014).

Member of Department of Art and Design Graphic Design Search Committees (2013-14).

Elected to Promotion and Tenure Committee, College of Arts and Sciences (2012-2013).

Elected to Drake University Center for the Humanities Governing Board (2010-2012).

Elected to University Faculty Senate (2009-2011).

Elected to College of Arts and Sciences Faculty Cabinet (2008-2010).

Member of Department of Art and Design Drawing Search Committee (2006-2007).

Elected to College of Arts and Sciences Faculty Cabinet (2006-2007).

Elected to College of Arts and Sciences Council (2005-2007).


Chair, Department of Art and Design Art History Search Committee (2004-2005).

Elected to Drake University Center for the Humanities Governing Board (2003-2006).

Elected to University Faculty Senate for two consecutive terms (2003-2007).

Member of Department of Art and Design Graphic Design Search Committee (Spring 2002).

Elected to College of Arts and Sciences Faculty Cabinet (2002-2004).

Elected to College of Arts and Sciences Council (2001-2003).

Appointed to University Honors Program Faculty Coordinating Board (2000-2003).

PROFESSIONAL SERVICE

National Endowment for the Humanities, Washington, DC. Member of a review panel for the 2015 NEH Summer Seminars and Institutes grant program, May 1, 2014.


Simpson College, Indianola, IA. Served as external evaluator for third-year review of tenure-track candidate in Art Department, spring 2012.
Reviewed and wrote letter of reference regarding proposal “Frank Lloyd Wright and the Prairie School in the Midwest,” submitted for consideration by the National Endowment for the Humanities Landmarks of American History and Culture: Workshops for School Teachers, spring 2012.

Review of manuscript on William Dunlap for the journal Literature in the Early American Republic, fall 2009.

Butler University, Indianapolis, IN. Reviewed tenure file for candidate in Art Department, summer 2009.

Humanities Iowa, Iowa City, IA. Served as the humanities evaluator for the granting agency funding the public programming surrounding World Histories, an exhibition organized by the Des Moines Art Center, April-June 2008.

Simpson College, Indianola, IA. Served on a panel of advisors to reassess the Art Department’s curriculum and their tenure-track position in art history, January 2008.

Iowa Public Television. Interviewed for the program A Century of Iowa Architecture about the designs by Eliel and Eero Saarinen for Drake University’s campus. Program aired in Fall of 2004 and Spring 2005.
Mark F. Vitha, Ph.D.

Office Address
Department of Chemistry
Drake University
2507 University Ave.
Des Moines, IA  50311
(515) 271-2596
mark.vitha@drake.edu

Home Address
3660 Grand Ave.
Unit 320
Des Moines, IA  50312
(515) 279-7298

Work Experience
• Professor, Drake University (2012-present).
• Associate Professor, Drake University (2004-2012).
• Assistant Professor, Drake University (1998-2004).
• Assistant Professor, University of Minnesota-Duluth (1997-1998).
• Laboratory Instructor, University of St. Thomas (1995).
• Head Analytical Chemistry Division Teaching Assistant, University of Minnesota (1993-1995).

Education
• University of Minnesota, Minneapolis, Minnesota (1992-1997).
  Degree: Doctor of Philosophy, Analytical Chemistry.
  Degree: Bachelor of Arts in Chemistry.

Courses Taught
• General Chemistry I.
• General Chemistry II.
• Quantitative Analysis.
• Instrumental Analysis.
• Instrumental Analysis for Pharmaceutical Science Majors (1 credit laboratory course).
• Characters in Science (Honors).
• Paths to Knowledge (Honors).

Awards and Honors
• Windsor Professor of Science, Drake University (2011-present).
• Ronald D. Troyer Research Fellowship, Drake University (2010-2011).
• Madelyn M. Levitt Teacher of the Year, Drake University (2003).
• Honors Program Teacher of the Year, Drake University (2003).
• Nominated for Madelyn M. Levitt Mentor of the Year Award (2009).
• Nominated for Drake University College of Arts and Sciences Teacher of the Year Award (2003).
• Journal of Chromatography Top Referees Award (2007, 2008).
• American Chemical Society Division of Analytical Chemistry Full-Year Fellowship (1997).
• University of Minnesota Edward Leete, Boehringer-Ingelheim Graduate Fellowship in Chemistry (1996).
• University of Minnesota Presidential Student Leadership and Service Award (1995).
• American Chemical Society Analytical Chemistry Award, University of St. Thomas (1991).
Editorships

University Committees and Service
- Chair, Provost Search Committee (2011).
- Chair, Student Evaluation Committee for College of Pharmacy and Health Science review of Dr. Geoff Wall (2010).
- Drake Faculty Senate Executive Committee (2009-2010).
- Chair, ad hoc Senate Executive Committee related to the role of UCC (2009).
- Drake University Academic Dishonesty Hearing Panel (2009-2010).
- College of Arts and Sciences Dean’s Search Committee (2006-2007, 2008-2009).
- Drake’s Accreditation Student Learning Committee (2004-2005, Vice-Chair 2006-2007).
- President’s Advisory Committee (2004-2005).
- First Year Seminar University Committee (1998-1999).

Professional Committees and Service
- ACS Division of Analytical Chemistry Education Committee (2003-present).

Funded Grants
1. Iowa Space Grant Consortium NASA Award, Mark F. Vitha, *Effects of Temperature on the Spectroscopic Shifts of Organic Molecules Dissolved in Water*, 02/99-12/99, $10,000.00.
6. National Science Foundation Course Curriculum and Laboratory Improvement Grant, Mark F. Vitha, LaRhee L. Henderson, Nita K. Pandit, *An Interdisciplinary Approach to Instrumental Analysis Involving Biochemical, Pharmaceutical, and Biological Samples*, 01/00-12/01, $46,000.00.

8. National Science Foundation Research Site for Educators in Chemistry – University of Minnesota Site, *Molecular Simulations of Chromatographic Partition Processes*, 01/02-01/03, $9,300.00.

9. National Science Foundation Research Site for Educators in Chemistry – University of Minnesota Site, *Exchange Visit of John Stubbs to Teach a Junior/Senior-level Class in Computational Chemistry at Drake University*, 01/03-01/04, $12,075.00.

10. National Science Foundation Course Curriculum and Laboratory Improvement Grant, Maria Del Valle Bohorquez, Mark F. Vitha, Nita K. Pandit, LaRhee Henderson, *Interdisciplinary Incorporation of Fluorescence Spectroscopy into the Upper-Level Undergraduate Laboratories*, 06/03-05/05, $79,221.00.


12. American Chemical Society Petroleum Research Fund Grant, Mark F. Vitha, *Fundamental Studies of the Solvatochromism of Hemicyanine Dyes and Their Application to Characterize Micelles Used to Enhance Oil Recovery*, 01/08 – 08/11, $63,000.00.

13. American Chemical Society Project SEED grant, Mark F. Vitha, *Fundamental Studies of the Solvatochromism of Hemicyanine Dyes and Their Application to Characterize Micelles Used to Enhance Oil Recovery*, 05/08 – 08/08, $5,000.00 (award to support two economically disadvantaged high school students to participate in a research internship in my laboratory).

14. Drake University Research Grant, *The Interface in Analytical Chemistry*, 02/09-05/09, $1,500.00

15. American Chemical Society Project SEED grant, Mark F. Vitha, *Fundamental Studies of the Solvatochromism of Hemicyanine Dyes and Their Application to Characterize Micelles Used to Enhance Oil Recovery*, 05/09 – 08/09, $6,100.00 (award to support two economically disadvantaged high school students to participate in a research internship in my laboratory).

16. Drake University Research Grant, Timothy Urness and Mark F. Vitha, *3D Visualization for Evaluating Chemical Separation Systems*, 01/10 – 05/10, $700.00.

17. American Chemical Society Project SEED grant, Mark F. Vitha, *Using Linear Solvation Energy Relationships to Study the Solvatochromism of Organic Dyes*, 05/10 – 08/10, $5,600.00 (award to support two economically disadvantaged high school students to participate in a research internship in my laboratory).

18. Pittsburgh Conference Memorial National College Grants Program, Mark F. Vitha, *Using NMR in General Chemistry Labs to Enhance Our Emphasis on Molecular Structure*, 03/13 – 04/14, $10,000.

**Publications**

**Books**


**Book Chapters**


Journal Articles


Invited Talks


Contributed Presentations


34. Drake University Center for the Humanities Colloquium, Des Moines, Iowa, September, 2010, “The DaVitha Code: or, How I Learned to Stop Worrying and Love the Chemistry of Art.” Mark F. Vitha and Maura E. Lyons.

35. Midwest University Analytical Chemistry Conference, Purdue University, West Lafayette, Indiana, October 2010, “Comparing RPLC Column Selectivity Differences Using a 3D Visualization Tool.” Mark F. Vitha and Andrew R. Johnson.


38. American Society for Mass Spectrometry, Minneapolis Convention Center, Minneapolis, Minnesota, June 2013, An Inter-Laboratory Study on a New, Extremely Accurate Retention Prediction Methodology for GC-MS, Brian Barnes, Michael Wilson, Panhia Yang, Mark Vitha, Amanda Tawfall, Lloyd Sumner, Adam Heuberger, Corey Broeckling, Jessica Prenni, Henry Corcoran, Gregory Janis; Shilpi Chopra, Nicholas Snow, Paul Boswell.


**Organization and Society Memberships**

- American Chemical Society
- Council of Undergraduate Research
- Midwestern Association of Chemistry Teachers in Liberal Arts Colleges
- Minnesota Chromatography Forum

* denotes undergraduate students.
† denotes high school students.