General Education Course Information Sheet

Please submit this sheet for each proposed course

Department & Course Number Chemistry 98Tb

Course Title Chemistry in the Home: An In-Depth Look at How Science Shapes Our Lives

1 Check the recommended GE foundation area(s) and subgroups(s) for this course

Foundations of the Arts and Humanities

- Literary and Cultural Analysis _____
- Philosophic and Linguistic Analysis _____
- Visual and Performance Arts Analysis and Practice _____

Foundations of Society and Culture

- Historical Analysis _____
- Social Analysis _____

Foundations of Scientific Inquiry

- Physical Science X
  With Laboratory or Demonstration Component must be 5 units (or more) _____
- Life Science _____
  With Laboratory or Demonstration Component must be 5 units (or more) _____

2. Briefly describe the rationale for assignment to foundation area(s) and subgroup(s) chosen.

This course focuses on aspects of chemistry, with emphasis on real-world application of organic and analytical topics. Hence, the Physical Science subgroup of Scientific Inquiry is most fitting for this course.

3. List faculty member(s) who will serve as instructor (give academic rank):
Hung Pham, Teaching Fellow; Ken Houk, Professor, Saul Winstein Chair in Organic Chemistry

4. Indicate when do you anticipate teaching this course:

2014-2015 Winter Enrollment X Spring Enrollment _____

GE Course Units **5**

5. Please present concise arguments for the GE principles applicable to this course.

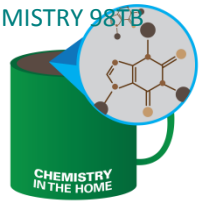
❑ General Knowledge	This course provides insight to a wide range of chemical phenomena in a real-life context, relevant to the everyday lives of the students.
❑ Integrative Learning	Students will be able to research and develop presentations on the various topics, stirring active discussion among their peers.
❑ Ethical Implications	The importance of green chemistry is one of many topics that will be discussed in this course. Also, ethics in scientific research will be considered when writing the final paper.
❑ Cultural Diversity	Although no emphasis will be put on cultural diversity, due to the scientific nature of the course, some focus will be put on how the human race can work together as a whole and affect/be affected by the chemistry around us.
❑ Critical Thinking	Reading and discussion of scientific papers and ideas will be facilitated by the students through weekly presentations, where they can propose topics/questions to consider.
❑ Rhetorical Effectiveness	As mentioned earlier, the students will present their analyses of the data relevant to their assigned topics, as well as compose their own final research paper.
❑ Problem-solving	Students will include a "current issues" portion of their presentation, where they can identify problems and propose solutions or further research on their topic.
❑ Library & Information Literacy	Progress towards preparing for their presentations and final papers require extensive research through multiple media of information, including journals, libraries, and online resources.

(A) STUDENT CONTACT PER WEEK (if not applicable write N/A)

1.	Lecture:	3	(hours)
2.	Discussion Section:	**N/A**	(hours)
3.	Labs	**N/A**	(hours)
4.	Experiential (service learning, internships, other):	**N/A**	(hours)
5.	Field Trips:	**N/A**	(hours)
	(A) TOTAL Student Contact Per Week	**3**	**(HOURS)**

(B) OUT-OF-CLASS HOURS PER WEEK (if not applicable write N/A)

1.	General Review & Preparation:	**3**	(hours)
2.	Reading	**2**	(hours)
3.	Group Projects:	**N/A**	(hours)
4.	Preparation for Quizzes & Exams:	**2**	(hours)
5.	Information Literacy Exercises:	**N/A**	(hours)
6.	Written Assignments:	**2**	(hours)
7.	Research Activity:	**3**	(hours)
	(B) TOTAL Out-of-class time per week	**12**	**(HOURS)**
	GRAND TOTAL (A) + (B) must equal at least 15 hours/week	**15**	**(HOURS)**



Chemistry 98Tb Seminar Syllabus: Chemistry in the Home

Introduction

Throughout elementary school, high school and even into college, we are rigorously taught and expected to learn a variety of disciplines, some of which may not seem relevant to our everyday lives at the time. However, the applicability of some subjects were much more apparent than others: Biology, to help us understand the workings of living entities; English and Mathematics, two irrefutably useful skills that are necessary for daily routine tasks; even History teaches us about our ancestors' decisions and how they have shaped the present world. But one area of study tends to be misunderstood and undervalued by students: Chemistry! And who can blame them? It can be hard to apply the knowledge of molecular collisions and subatomic particles, which are invisible to the naked eye, to real life. And perhaps being able to perform titrations and dilutions does not necessarily improve people's daily lives.

…Or does it?

This seminar aims to increase the awareness of the prevalence of chemistry in our everyday world by calling attention to the science behind commonplace occurrences. Using the house as a familiar setting, we will concentrate on various instances in the home that we have been exposed to our entire lives, from food chemistry in the kitchen to house cleaners in the bathroom, and even the science of sleeping in our bedrooms. These topics will serve as catalysts for open discussion about larger scale subjects such as efforts in "green chemistry" and methodologies of the polymer industry. Throughout the seminar, students will get a look into research approaches and procedures, providing in-depth critiques and discussion facilitation with an opportunity to propose their own groundbreaking investigations.

Objectives

By the end of the course, students should be able to:

- Recognize and appreciate the prevalence of chemistry (and physical sciences in general) in their everyday lives
- Critically analyze and interpret cross-disciplinary research, ranging from technical scientific journals to writings aimed more towards general audiences
- Facilitate and direct an intellectual discussion concerning chemistry-related topics among peers
- Develop novel ideas and effectively perform background literature searches in preparation to conduct their own original research

Requirements and Grading

1. The syllabus with the weekly reading schedule will be supplied to the students on the first day of class. Hence, they students will be expected to actively participate in every discussion with thoughtful insights, questions, and speculations pertaining to the topic at hand. Suggestions for specific topics in future weeks will also be requested during Week 1.
2. Each week (starting Week 2), one or two students will serve as discussion leader(s) who will facilitate the analyses of the readings, pose questions for the class to consider, and direct the course of the class discussion. Signups will occur at the beginning of the quarter, and meetings with the instructor will be held throughout the quarter with the discussion leaders for any necessary assistance.
3. Two quizzes will be given during the course of the quarter, one during Week 5 and one during Week 10. These quizzes are designed to ensure that students are keeping up with the material/discussions in class.
4. A final research paper will be required of each student, due at the end of the quarter, which will consist of performing an extensive literature search on a chemistry-related topic of their choosing, reporting and analyzing the information already known, and proposing viable research ideas for further investigations. Students will choose their topic and meet with the instructor prior to the end of Week 6. During the following weeks, students will be expected to use the resources provided to them to create a rough draft, due in Week 8, when each student must make an appointment to meet with the instructor for critiques. The final draft will be due during Week 10. More details will be provided when appropriate.
5. During Week 10, the students will also give a 10-minute presentation on their final paper topic, summarizing the key points and main ideas of their literature search.

To summarize the above requirements, the grade breakdown is as follows:

Weekly Active participation: **15%**
Discussion Facilitation: **20%**
Mid-quarter Quiz (Week 5): **10%**
End-quarter Quiz (Week 10): **10%**
Final Presentation (Week 10): **10%**
Final Paper (Due week 10): **35%**

Late assignments will be penalized 10% (of the maximum score allotted for that assignment) per day overdue, up to a maximum of 50%. After one week, late assignments will not be accepted without permission from the instructor in advance.

Quizzes cannot be made up unless a valid reason is provided to and permitted by the instructor. If a quiz is missed, you will receive a grade of zero for that quiz, but the other quiz will then be worth 15% of your grade (resulting in a 5% reduction in maximum possible quiz points).

Detailed Reading Schedule

A large portion of the readings will come from the following sources. Although the entirety of these sources may not be assigned, students are encouraged to read beyond the assigned chapters.

Knight, Judson. *Science of Everyday Things, Vol. 1 – Chemistry*. Farmington Hills: The Gale Group, 2002. Print.

Knight, Judson. *Science of Everyday Things, Vol. 3 – Biology*. Farmington Hills: The Gale Group, 2002. Print.

Schwarcz, Joseph. *Science, Sense & Nonsense*. Toronto, Ontario: ECW Press, 2000. Print.

Schwarcz, Joseph. *The Genie in the Bottle*. Toronto, Ontario: ECW Press, 2001. Print.

Schwarcz, Joseph. *That's the Way the Cookie Crumbles*. Toronto, Ontario: ECW Press, 2002. Print.

Schwarcz, Joseph. *The Fly in the Ointment*. Toronto, Ontario: ECW Press, 2004. Print.

Schwarcz, Joseph. *Let Them Eat Flax.* Toronto, Ontario: ECW Press, 2005. Print.

Brown, William H., Brent L. Iverson, Eric V. Anslyn, and Christopher S. Foote. *Organic Chemistry*. 7th ed. Belmont: Brooks/Cole, 2014. Print.

Week 1: Introduction to Chemistry and our World

Knight, J. *Science of Everyday Things, Vol. 1 – Chemistry.* "Measurement" pp. 3-31, "Matter" pp. 32-62, "Atoms and Molecules" pp.63-118, "Elements" pp 119-148, "Metals" pp. 149-212, "Non-metals and Metalloids" pp. 213-262.

Burke, H.-D. *Essentials of Chemical Education*. Heidelberg: Springer-Verlag, 2012 pp. 217-230.

Week 2: Chemistry and the Bathroom (Cleaners, Oxidation and Rust)

Knight, J. *Science of Everyday Things, Vol. 1 – Chemistry.* "Bonding and Reactions" pp. 263-328, "Solutions and Mixtures" pp. 329-362

Schwarcz, J. *Let Them Eat Flax.* pp. 122-125, 128-132.

Schwarcz, Joseph. *The Fly in the Ointment*. "Hard-Water Woes" pp. 188-191.

Coons, D. M. *J. Am. Oil Chemists' Soc.* **1978**, *55*, 104-108. "Bleach: Facts, Fantasy, and Fundamentals"

Bello, A. et al. *Environmental Health* **2010**, *9*, 76-85.

Week 3: Chemistry in the Backyard (Swimming Pool, Pets)

Thayer, A. *Chem. Eng. News* **2007**, *85*, 70: "Pool Chemicals"

Richardson, S. D. et al. *Environ. Health Perspect.* **2010**, *118*, 1523-1530. "What's in the Pool?"

Schwarcz, Joseph. *The Fly in the Ointment*. "Sex and Scents" pp. 141-144.

Liberles, S. D. *Proc. Natl. Acad. Sci.* **2011**, *108*, 11235–11240. "Detection and avoidance of a carnivore odor by prey"

Week 4: Chemistry in the Kitchen (Food Chemistry)

Knight, J. *Science of Everyday Things, Vol. 3 – Biology.* "Metabolism" pp. 33-54. "Nutrition" pp. 67-98.

This, H. *Acc. Chem. Res.* **2009**, *42*, 575-583. "Molecular Gastronomy, a Scientific Look at Cooking"

Schwarcz, Joseph. *That's the Way the Cookie Crumbles*. "Cookware Chemistry" pp. 173-175.

Brown, W. H. *Organic Chemistry.* "Trans Fatty Acids" p. 256.

Week 5: Chemistry in the Medicine Cabinet (Drugs and the Brain/Body)

Knight, J. *Science of Everyday Things, Vol. 3 – Biology.* "Brain and Body - Chemoreception" pp. 295-305.

Lovinger, D. M. *Alcohol Res Health* **2008**, *31*, 196-214. "Communication networks in the brain: neurons, receptors, neurotransmitters, and alcohol"

Brown, W. H. *Organic Chemistry.* "Chiral Drugs" pp 143-144.

Helpful website: http://biop.ox.ac.uk/www/mol_of_life/molecules_of_life.html

Week 6: Chemistry in the Bedroom (Sleep, Pheromones)

Knight, J. *Science of Everyday Things, Vol. 3 – Biology.* "Brain and Body – Biologicial Rhythms" pp. 306-318.

"Brain Basics: Understanding Sleep." : National Institute of Neurological Disorders and Stroke (NINDS). Web. 03 March 2014.

Schwarcz, J. *The Fly in the Ointment*. "There's no Viagra in Niagara" pp. 159-162.

Grammer, K.; Fink, B.; Neave, N. *Eur. J. Obstet. Gyn. R. B.* **2005**, *118*, 135-142. "Human Pheromones and Sexual Attraction."

Week 7: Chemistry in the Laundry Room (Polymer Chemistry, Laundry)

Knight, J. *Science of Everyday Things, Vol. 1 – Chemistry.* "Polymer Chemistry" pp. 372-381.

Schwarcz, J. *The Fly in the Ointment*. "The Wonders of Polyester" pp. 163-166

Brown, W. H. *Organic Chemistry.* "Recycling of Plastics" pp. 1206-1207.

Schwarcz, J. *That's the Way the Cookie Crumbles*. "Soap Story" and "Detergents and Drowning Fleas" pp. 200-206.

Schwarcz, J. *Science, Sense & Nonsense*. (PDF) "Greening Dry Cleaning," "The Greening of Chemistry" pp. 109-116.

Week 8: Chemistry in the Garage (Car Emissions, Green Chemistry, Atmospheric Chemistry)

Kevin Sulivan's Autoshop 101. "Emissions #1 – Combustion Chemistry" http://www.autoshop101.com/forms/h55.pdf

Wallington, T. J.; Kaiser, E. W.; Farrell, J. T. *Chem. Soc. Rev.* **2006**, *35*, 335-347. "Automotive fuels and internal combustion engines: a chemical perspective"

Linthorst, J. A. *Found. Chem.* **2010**, *12*, 55-68. "An overview: Origins and Development of Green Chemistry"

Brown, W. H. *Organic Chemistry.* "Freons" p. 318.

Rowland, F. S. *Angew. Chem. Int. Ed. Eng*. **1996**, *35*, 1786-1798. (Nobel Lecture)

Week 9: Chemistry and Technology (Appliances, Computer Processors, Solar Cells)

Mercola, Joseph. "Is This Common Kitchen Appliance Harming Your Health?" *Huffington Post,* 25 August 2010. Web.

Cohen, Alan. "The Chemistry of Computing." *PC Magazine,* 5 April 2006. <www.pcmag.com/article.aspx/curl/1938467>

DOE/Lawrence Berkeley National Laboratory. "Cooling microprocessors with carbon nanotubes." *ScienceDaily*, 22 January 2014. Web <www.sciencedaily.com/releases/2014/01/140122153912.htm>

Grätzel, M. *Nature* **2001**, *414*, 338-344. "Photoelectrochemical Cells"

Week 10: Final Presentations

New Course Proposal

Chemistry & Biochemistry 98TB
Chemistry at Home: In-Depth Look at How Science Shapes Our Lives

Course Number	**Chemistry & Biochemistry 98TB**
Title	**Chemistry at Home: In-Depth Look at How Science Shapes Our Lives**
Short Title	**CHEMISTRY AT HOME**
Units	Fixed: **5**
Grading Basis	**Letter grade only**
Instructional Format	**Seminar - 3 hours per week**
TIE Code	**SEMT - Seminar (Topical) [T]**
GE Requirement	**Yes**
Major or Minor Requirement	**No**
Requisites	**Enforced requisite: satisfaction of Entry-Level Writing requirement. Freshmen/sophomores preferred.**
Course Description	**Seminar, three hours. Enforced requisite: satisfaction of Entry-Level Writing requirement. Freshmen/sophomores preferred. Role of chemistry in daily life; use of home as familiar setting to discuss topics such as chemistry of sleep, polymer chemistry, green chemistry, acid/base reactions, and food chemistry. Letter grading.**
Justification	**Part of the series of seminar offered through the Collegium of University Teaching Fellows.**
Syllabus	File *Chem 98Tb Syllabus.pdf* was previously uploaded. You may view the file by clicking on the file name.
Supplemental Information	**Professor Ken Houk is faculty mentor for this seminar.**
Grading Structure	**Weekly Active participation: 15% Discussion Facilitation: 20% Mid-quarter Quiz (Week 5): 10% End-quarter Quiz (Week 10): 10% Final Presentation (Week 10): 10% Final Paper (Due week 10): 35%**
Effective Date	**Winter 2015**
Discontinue Date	**Summer 1 2015**
Instructor	Name: **Hung Pham** Title: **Teaching Fellow**
Quarters Taught	☐ Fall ☐ Winter ☐ Spring ☐ Summer
Department	**Chemistry**
Contact	Name: **CATHERINE GENTILE** E-mail: **cgentile@oid.ucla.edu**
Routing Help	

ROUTING STATUS

Role: Registrar's Office

Status: Processing Completed

Role: Registrar's Publications Office - Hennig, Leann Jean (LHENNIG@REGISTRAR.UCLA.EDU) - 56704

Status: Added to SRS on 8/5/2014 4:57:58 PM

Changes: Title, Short Title, Requisites, Description

Comments: Edited course description into official version; corrected requisites.

Role: Registrar's Scheduling Office - Thomson, Douglas N (DTHOMSON@REGISTRAR.UCLA.EDU) - 51441
Status: Added to SRS on 7/1/2014 6:36:22 PM
Changes: Short Title
Comments: No Comments

Role: L&S FEC Coordinator - Castillo, Myrna Dee Figurac (MCASTILLO@COLLEGE.UCLA.EDU) - 45040
Status: Returned for Additional Info on 6/5/2014 3:42:50 PM
Changes: No Changes Made
Comments: Routing to Doug Thomson in the Registrar's Office.

Role: FEC Chair or Designee - Palmer, Christina (CPALMER@MEDNET.UCLA.EDU) - 44796
Status: Approved on 6/4/2014 5:45:58 PM
Changes: No Changes Made
Comments: No Comments

Role: FEC Chair or Designee - Castillo, Myrna Dee Figurac (MCASTILLO@COLLEGE.UCLA.EDU) - 45040
Status: Returned for Additional Info on 6/2/2014 4:11:01 PM
Changes: No Changes Made
Comments: Routing to Christina Palmer for FEC approval.

Role: CUTF Coordinator - Gentile, Catherine (CGENTILE@OID.UCLA.EDU) - 68998
Status: Approved on 5/30/2014 12:27:33 PM
Changes: No Changes Made
Comments: on behalf of Professor Kathleen L. Komar, chair, CUTF Program Faculty Advisory Committee

Role: Initiator/Submitter - Gentile, Catherine (CGENTILE@OID.UCLA.EDU) - 68998
Status: Submitted on 5/30/2014 12:26:41 PM
Comments: Initiated a New Course Proposal

Back to Course List

Comments or questions? Contact the Registrar's Office at
cims@registrar.ucla.edu or (310) 206-7045