

# Chemistry Education in a Feminist and Multicultural Context

(SIED 5327 [28514] - 2018 Spring)

Revised on January 13, 2018

Department of Teacher Education  
College of Education  
University of Texas at El Paso

**Course Format:** Online, 16 weeks

**Instructor:** Dr. Pei-Ling Hsu

**Office:** Room 606, UTEP Education Building

**Phone:** (915) 747-6446

**E-mail:** [phsu3@utep.edu](mailto:phsu3@utep.edu)

**Website:** <http://peilinghsu.utep.edu>

**Office hours:** By appointments

\*This syllabus is subject to change as needed. Any changes to the syllabus will be announced on blackboard.

## Course Description

SIED 5327 Chemistry Education in a Feminist and Multicultural Context- - Chemistry learning experiences in a relevant cultural context. A conceptual understanding of basic chemistry content, including the impact of chemistry in daily life. Develops competencies necessary to provide multicultural education instruction and inclusive pedagogy and the understanding of social, economic, and political influences on access issues in science education for all students. Includes environmental chemistry labs and an environmental action project. This is an opportunity to develop competencies necessary to deal effectively with multicultural education instruction; includes curriculum, concepts, teaching strategies, and skills necessary to integrate content and teaching strategies. (This section will focus specifically on science education in multicultural and feminist context).

## Student Learning Outcomes:

Upon completion of the course, students will be better prepared to:

- 1) Take into account the full diversity of student population and cultural and gender biases in designing effective science instruction and actively involve students from groups who have been traditionally underrepresented in the sciences.
- 2) Understand social, economic, and political influences on access issues in quality science education for all students.
- 3) Link the science learning experiences to the students' cultural contexts.
- 4) Understand how the environment inside and outside the school affects the learning of science.
- 5) Understand how to serve as advocates for their students and for quality science education.

\* Assessment of course objectives will be accomplished by assessing the student's course assignments and participation.

## UTEP EDGE Alignments:

This course will help students gain experience of (1) research and scholarly activity, (2) learning communities, (3) creative activity and help students enhance skills of (1) problem-solving, (2) communication, and (3) critical thinking.

## Readings and Reflections

Required texts for the course:

- Reading 1: The Association of American Colleges & Universities. (1999). Frequently asked questions about feminist science studies. The Association of American Colleges & Universities.
- Reading 2-6: National Research Council. (2007). Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering. Washington, DC: The National Academies Press. (Available free at <https://www.nap.edu/catalog/11741/beyond-bias-and-barriers-fulfilling-the-potential-of-women-in> )
- Reading 7-10: Scantlebury, K., Kahle, J. B., & Martin, S. N. (2010). Re-visioning Science Education from Feminist Perspectives: Challenges, Choices and Careers. The Netherlands: Sense Publishers. [ISBN-10: 946091084X; ISBN-13: 978-9460910845]

Additional Resources: Additional articles/resources will be posted as links in Blackboard.

### **Technology Requirements and Support**

- This course is an online course using the Blackboard system. Each participant must be able to use their UTEP email address and password in order to use their UTEP Blackboard account.
- If you encounter any technical issue in Blackboard, please contact UTEP-Help Desk to solve problems. Phone: 915-747-4357. Email: [Helpdesk@utep.edu](mailto:Helpdesk@utep.edu). The University of Texas at El Paso offers complete technical information and help desk support at: <https://admin.utep.edu/Default.aspx?tabid=74092>

### **Resources**

- Blogger: <http://www.blogger.com>
- WordPress: <http://wordpress.org>
- National Academies Press: <http://www.nap.edu/>
- Next Generation Science Standards (NGSS): <http://www.nextgenscience.org/next-generation-science-standards>
- Assessments Tools in Informal Science (ATIS): <http://www.pearweb.org/atis/>
- Informal Science: <http://informalscience.org/>
- CAISE (Center for Advancement of Informal Science Education): <http://caise.insci.org/>
- Informal Science Education Evidence Wiki: [http://iseevidencewiki.org/index.php/Main\\_Page](http://iseevidencewiki.org/index.php/Main_Page)
- Texas Education Agency (TEA): <http://www.tea.state.tx.us/index.aspx>
- Texas Essential Knowledge and Skills (TEKS): <http://www.tea.state.tx.us/index2.aspx?id=6148>

### **Assignments**

#### **1. Knowledge Enrichment (66%)**

In this course, each student will read articles and engage in discussions to enrich knowledge about feminism and its relationship to science education.

#### **(1) Feminism and Science Images I & II (6 %, 3% at the beginning of the semester and 3% at the end of the semester)**

Students will submit one image with 100 words of descriptions to represent their understanding about the relationship between feminism and science at the beginning of the semester (image I) and at the end of the semester (image II).

#### **(2) Blogging Reading Reflection 1-10 (40%, each reflection is worth 4%)**

Each student will post ten reflections of corresponding reading in discussion blogs according to the schedule. Each reflection (minimum 500 words) should include (1) summary of the reading with a visual representation, (2) ideas for possible project proposals, (3) concerns and questions

for the readings or project proposals. Each reflection should cite at least 2 references and post the 2 references at the end of each reflection. The titles for the reflection posts should indicate student name and reflection number: “Pei-Ling Hsu - Reflection 1,” “Pei-Ling Hsu - Reflection 2,” etc.

**(3) Responses to Other Classmates’ Blogs on the Ten reflections (20%, each response is worth 1%)**

Each student will respond to at least 2 other classmates’ reflections weekly. Each response should: (1) identify merits, (2) suggest ideas for improvements, and (3) end the response with a question. Each week, each student will choose 2 different classmates’ blogs to respond each time. The minimum of a response is 100 words. A record of these responses will be posted and updated in Blackboard. Students should check the record regularly and let the instructor know immediately if there is any question about the updated record.

**2. Environmental Action Project Proposal (34%)**

In this course, each student will propose an environmental action project proposal that applies the knowledge learned in the course.

**(1) Project Proposal Draft (12%)**

Each student will write a project proposal that covers science content that is relevant today as it explores the contradictory nature of science. Students examine science-related issues from multiple points of view and become critical consumers of science as they challenge many mainstream assumptions. Sample topics include: birth control, teeth whiteners, plastic water bottles, chemicals of war, global warming, environmental change, fetal development, oil spills, bubble baths, make up, valium and other mood adjusting drugs... and the list goes on and on. Meanwhile, the science content should be situated in political, economic, social, historical, and gender context (Does not have to be all of these, but tie curriculum unit is integrated with other relevant fields.). The pedagogy design in the project should leads students to be actively engaged with the content through inquiry and collaboration with peers and expert sources of information (teacher, text, the learning activity, etc.). The project should include at least has one collaborator (e.g., teacher, staff, zoo, museum) and serves at least 10 participants (e.g., students, families) for 40-60 hours to be implemented in 2018 Summer. A project proposal draft is written to show the rationale and plan for implementing the project. Students are provided with “Template01-Project Proposal Draft” to fill out. The project proposal draft (minimum 2500 words) should be submitted to the corresponding assignment section in Blackboard AND B-email the proposal to all in the class.

**(2) Proposal Written Review (10%)**

Each student will review two other classmates’ project proposal drafts and will provide feedback (minimum 500 words for each review) for improvements. Students are provided with “Template02-Proposal Written review” to fill out. Each written review may include but not limit to (1) praise for merits, (2) identifications of weakness, and (3) ideas and suggestions for improvements. The project written review should be submitted to the corresponding assignment section through the Blackboard system and AND B-email the written review to all in the class.

**(3) Final Project Proposal (12%)**

Students will revise and improve their proposal report drafts according to the feedback they receive from the instructor and the class. Students are provided with “Template03-Proeic Proposal” to fill out. The project proposal (minimum 3500 words) should be submitted to the corresponding assignment section in Blackboard.

**3. Bonus point (1%):** Email your screen shot of online evaluation completion to Dr. Hsu ([phsu3@utep.edu](mailto:phsu3@utep.edu)). This screen shot should only show that you completed the course’ online evaluation and should not include the evaluation itself.

### **Course Requirements:**

1. Due time is **11:59PM** for ALL electronic submissions. Delayed submissions of any assignments will cause grade reductions. One delay day causes 10% reduction of a deserved grade, two delay days causes 20% of a deserved grade, and so on. **All (delayed) assignments have to be submitted before May 6, 2018.** Grading Evaluations: A (90% - 100%), B (80% - 89%), C (70%-79%), D (60%-69%) F (<60%)
2. Each electronic file of assignments should not exceed 10 MB.

### **Online Etiquette (Netiquette)**

Meaningful and constructive dialogue is encouraged in this class and requires a degree of mutual respect, willingness to listen, and tolerance of opposing points of view. Respect for individual differences and alternative viewpoints will be maintained at all times in this class. One's words and use of language should be temperate and within acceptable bounds of civility and decency. Discussion, chat, and e-mail spaces within this course are for class purposes only, unless otherwise stated. Please remember to conduct yourself collegially and professionally. Unlike in the classroom setting, what you say in the online environment is documented and not easily erased or forgotten.

### **Accommodation**

If you have a disability and need classroom accommodations, please communicate your needs to the instructor and contact The Center for Accommodations and Support Services (CASS) at 747-5148, or by email to [cass@utep.edu](mailto:cass@utep.edu), or visit their office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at [www.sa.utep.edu/cass](http://www.sa.utep.edu/cass).

### **Standards of Academic Integrity**

Students are expected to uphold the highest standards of academic integrity. Any form of scholastic dishonesty is an affront to the pursuit of knowledge and jeopardizes the quality of the degree awarded to all graduates of UTEP. Any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes, but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are not attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts. Proven violations of the detailed regulations, as printed in the Handbook of Operating Procedures (HOP) and available in the Office of the Dean of Students, may result in sanctions ranging from disciplinary probation, to failing grades on the work in question, to failing grades in the course, to suspension or dismissal among others. You may learn what count as plagiarism in this website: <http://www.plagiarism.org/>

### **Equal Educational Opportunity**

In order to create equal educational opportunities in the class, all students are expected to demonstrate respect for the diverse voices and individual differences in the class. Particularly, no person shall be excluded from participation in, denied benefits of, or be subject to discrimination under any program or activity sponsored or conducted by the University of Texas at El Paso on the basis of race, color, national origin, religion, sex, age, veteran status, disability, or sexual orientation. Any member of the University community who engages in discrimination or other conduct in violation of University policy is subject to the full range of disciplinary action, up to and including separation from the University. Complaints regarding discrimination should be reported to the University's Equal Opportunity Office. Inquiries regarding applicable policies should be addressed to the University's Equal Opportunity Office, Kelly Hall, 3<sup>rd</sup> Floor, 915.747.5662 or [eoaa@utep.edu](mailto:eoaa@utep.edu) <<mailto:eoaa@utep.edu>>.

**Course Schedule:** Changes may be made during the classes. Students should follow the latest changes.

No	Date	Topic	Reading Materials	Assignments Due (11:59PM)
01	Jan 16-Jan 21	Syllabus review	Course Introduction & Review Syllabus	-Feminism and Science Images I (Due: Jan 21 )
02	Jan 22-Jan 28	Understanding equity in access in the context of science education	Reading 1 (p. 1-20)	-Reflection 1 (Due: Jan 25) -Response 1 (Due: Jan 28)
03	Jan 29-Feb 4	Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering	Reading 2-Ch 1&2 (p. 1-49)-AACU	-Reflection 2 (Due: Feb 1) -Response 2 (Due: Feb 4)
04	Feb 5-Feb 11		Reading 3-Ch 3 (p. 50-112)-NRC	-Reflection 3 (Due: Feb 8) -Response 3 (Due: Feb 11)
05	Feb 12-Feb 18		Reading 4-Ch 4 (p. 113-159)-NRC	-Reflection 4 (Due: Feb 15) -Response 4 (Due: Feb 18)
06	Feb 19-Feb 25		Reading 5-Ch 5 (p. 160-213)-NRC	-Reflection 5 (Due: Feb 22) -Response 5 (Due: Feb 25)
07	Feb 26-Mar 4		Reading 6-Ch 6 (p. 214-244)-NRC	-Reflection 6 (Due: Mar 1) -Response 6 (Due: Mar 4)
08	Mar 5-Mar 11		Re-visioning Science Education from Feminist Perspectives: Challenges, Choices and Careers	Reading 7-Ch 1-6 (p. 1-68)-Scantlebury
09	Mar 12-Mar 18	Spring Break		
10	Mar 19-Mar 25	Reading 8-Ch 7-11 (p. 69-124) – Scantlebury		-Reflection 8 (Due: Mar 22) -Response 8 (Due: Mar 25)
11	Mar 26-Apr 1	Reading 9-Ch 12-15 (p. 125-178) – Scantlebury		-Reflection 9 (Due: Mar 29) -Response 9 (Due: Apr 1)
12	Apr 2-Apr 8	Reading 10-Ch 16-19 (p. 179-220) – Scantlebury		-Reflection 10 (Due: Apr 5) -Response 10 (Due: Apr 8)
13	Apr 9-Apr 15	Engaging students in inquiry based learning projects through feminist science pedagogy	Apply previous readings to the project proposal	
14	Apr 16-Apr 22		Apply previous readings to the project proposal	-Project proposal draft (Due: Apr 22, template 1, B-Email to everyone)
15	Apr 23-Apr 29		Apply previous readings to the project proposal	-Proposal written review (Due: Apr 29, template 2, B-Email to everyone)
16	Apr 30-May 6		Apply previous readings to the project proposal	-Feminism and Science Images I (Due: May 3 ) -Final Project proposal (Due: May 6, template 3) -Online evaluation (Due: May 6)

Appendixes:

**Grading Rubric for “Reflection”**

	67-100%	34-66%	0-33%
Follow instructions to cover required content	Reflection (minimum 500 words) should include (1) summary of the reading with a visual representation, (2) ideas for possible project proposals, (3) concerns and questions for the readings or project proposals. Each reflection should cite at least 2 references and post the 2 references at the end of each reflection. The titles for the reflection posts should indicate student name and reflection number: “Pei-Ling Hsu – Reflection 1,” “Pei-Ling Hsu – Reflection 2,” etc.	Reflection covers most of the requirements.	Reflection covers only a few requirements.
Analysis / Interpretation	The reflection uses sources, including outside as well as required reading. In addition, it demonstrates that the student has gained new understanding of the topic.	Some reflections do analysis or interpretation well, but a significant number do not. This might be because the analysis was not done well or because it was not attempted (that is, was simply opinion).	Reflections generally show little evidence of analysis, consisting instead of opinion and feelings and impressions.
Writing Skill	Sentences are clear and wording is unambiguous. Correct word choice, correct spelling, and correct grammar. Writing style can still be conversational rather than formal. The writing does not have to be flawless, but it will be better than average writing.	Ordinary, good writing. Lapses are regular and patterned, but do not undermine the communication or the persuasiveness of the argument.	Grammar, spelling, and/or word choice errors are frequent enough that the sense of the message is lost or muddled.

**Grading Rubric for “Project Proposal”**

	67-100%	34-66%	0-33%
A.1. Project title	-The title is intriguing, succinct and represents the project	-The title is intriguing and represents the project	-The title is intriguing but does not represent the project
A.2. Issues to be addressed in the project	-Identify existing issues or problems -Draw on research-based findings to address the importance of the project -Articulate the potential of the project to address the existing issues and problems	-Identify existing issues or problems -Loosely draw on research-based findings to address the importance of the project -Articulate the potential of the project to address the existing issues and problems	-No identification of existing issues or problems -Do not address the importance of the project -The link to research is weak
A.3. Project objectives	-Concise descriptions of what learners are expected and able to do by the end of the project - Objective statements include a variety of actions verbs that address what learners will be able to “do” - There is evidence in the assessment section that students’ learning is linked to the concepts and skills addressed in the learning objectives.	- Descriptions of what learners are expected to learn are general. -Most action verbs in the objective statements do not address what learners will be able to “do” -Fail to show connection with the assessment section.	-The description of the learning objectives is vague. -Action verbs in the objective statements do not support meaningful learning. -Fail to show connection with the assessment section.
A.4.	-Describe thoroughly what are the	-Describe superficially what are	-Describe superficially how the

Intervention – learned in the course	knowledge learned in the course -Describe thoroughly how these knowledge apply to the project -Cite the readings assigned in the course	the knowledge learned through self-study -Describe superficially how these knowledge apply to the project -Cite the readings assigned in the course	knowledge learned in the course provides guideline to the project -Describe superficially how these knowledge apply to the project -Do not cite the readings assigned in the course
A.5. Intervention – learned through self-study	-Describe thoroughly what are the knowledge learned through self-study -Describe thoroughly how these knowledge apply to the project -Cite self-study readings	-Describe superficially what are the knowledge learned through self-study -Describe superficially how these knowledge apply to the project -Cite self-study readings	-Describe superficially what are the knowledge learned through self-study -Describe superficially how these knowledge apply to the project -Do not cite self-study readings
A.6. Texas Essential Knowledge and Skills alignment	-Listed standards reflect the grade level, concepts and skills learned in the project -There is evidence (i.e., in the assessment section) that student’s learning is linked to the components of the listed standards.	-Listed standards reflect the grade level and the concepts -Partial evidence (i.e., in the assessment section) that student’s learning is linked to the components of the listed standards.	-Project is loosely connected to the standards.
A.7. Next Generation Science Standards alignment	-Listed standards reflect the grade level, concepts and skills learned in the project -There is evidence (i.e., in the assessment section) that student’s learning is linked to the components of the listed standards.	-Listed standards reflect the grade level and the concepts -Partial evidence (i.e., in the assessment section) that student’s learning is linked to the components of the listed standards.	-Project is loosely connected to the standards.
B.1. Collaborators	-Identify at least one collaborator for this project -Evidence of support from the collaborators	-Identify at least one collaborator for this project -No evidence of support from the collaborators	-No identification of collaborators for the project
B.2. Age of participants	-Identify the age range of participants -The project is suitable for the age identified	-There are some concerns of the use of the project for this grade	-The project is not suitable for the grade identified
B.3. Number of participants	-Engage in at least 10 participants in this project -The project is suitable for the number of participants	-Engage in 5-9 participants in this project -The project is suitable for the number of participants	-Engage in 1-4 participants in this project -The project is not suitable for the number of participants
B.4. Participant recruitment plan	-Describe timeline and activities of recruiting participants for this project -Activities are logically sequenced, so that learning builds progressively; connections between activities are clearly made	-Describe only timeline or activities of recruiting participants for this project	- Activities do not have a logical sequence.
B.5. Timeline of activities	-Time is appropriate -Timeline of activities is clearly described -These activity relates to the project objectives	-Time is somewhat inappropriate	-Time is not described or inappropriate
B.6. Materials and resources required	-Required materials and resources are clearly listed -Reference in procedures are clearly defined as to they are to be utilized	- Most of the required resources and materials are listed. -Some reference or clear definition in procedures	- Some citing of resources through the lessons; materials listed but not included in the procedures
B.7. Plan to obtain materials and resources	-Describe timeline and activities of obtaining materials and resources for this project	-Describe only timeline or activities of obtaining materials and resources	-No plan description of obtaining materials and resources
B.8. Safety considerations	-Safety concerns are discussed; suggestions or solutions for	-Safety concerns are discussed	-Safety concerns are not discussed

	addressing these safety concerns are provided		
B.9. Scientific Topics involved	<ul style="list-style-type: none"> <li>-Topics show sequence and progression.</li> <li>-The descriptions of these topics are fully introduced</li> <li>-Opportunities are provided for students to link daily work to past and upcoming content/skills.</li> </ul>	<ul style="list-style-type: none"> <li>-Topics show somewhat sequence and progression.</li> <li>-The descriptions of these topics are provided</li> <li>-Opportunities are provided for students to link daily work to past and upcoming content/skills.</li> </ul>	<ul style="list-style-type: none"> <li>-Topics does not consider the proper sequence and progression</li> <li>-No descriptions of these topics are provided</li> <li>-No relevant connections to students' daily life</li> </ul>
C.1. Formative assessments	<ul style="list-style-type: none"> <li>-Assessments allows an understanding of students' learning process for necessary adjustments and improvements</li> <li>-There are a variety of assessment practices</li> <li>-Assessment tools are designed to address instructional objectives and standards.</li> <li>-Assessment practices are engaging and relevant.</li> </ul>	<ul style="list-style-type: none"> <li>-Assessments are linked to objectives and standards.</li> <li>-There is no variety of assessment practices.</li> </ul>	<ul style="list-style-type: none"> <li>-Assessment provides little or no evidence for student understanding of the new concept/skill.</li> </ul>
C.2. Summative assessments	<ul style="list-style-type: none"> <li>-Assessments allows an overview understanding of the impact of the project</li> <li>-Assessment tools are designed to address instructional objectives and standards.</li> <li>-Assessment practices are engaging and relevant.</li> </ul>	<ul style="list-style-type: none"> <li>-Assessments are linked to objectives and standards.</li> <li>-There is no variety of assessment practices.</li> </ul>	<ul style="list-style-type: none"> <li>-Assessment provides little or no evidence for student understanding of the new concept/skill.</li> </ul>
D. Feminism Alignment	<ul style="list-style-type: none"> <li>-Apply feminism knowledge to design the project</li> <li>-Explain how the project activities help students become critical consumers of science</li> </ul>	<ul style="list-style-type: none"> <li>-Partially apply feminism knowledge to design the project</li> <li>-Partially explain how the project activities help students become critical consumers of science</li> </ul>	<ul style="list-style-type: none"> <li>-The project design does not align with feminism philosophy</li> </ul>
E. Reference	<ul style="list-style-type: none"> <li>-More than 20 references are cited for the project proposal</li> <li>-Reference sources are formatted in APA style and cited clearly</li> </ul>	<ul style="list-style-type: none"> <li>-Six to ten references are cited</li> <li>-Reference sources are indicated and cited clearly</li> </ul>	<ul style="list-style-type: none"> <li>-One to five references are cited</li> <li>-Reference sources are indicated and cited vaguely</li> </ul>
F. Appendixes	<ul style="list-style-type: none"> <li>-Attach all necessary information that help readers understand the project (e.g., instruments, curriculum, working sheets)</li> </ul>	<ul style="list-style-type: none"> <li>-Attach most of the relevant information that help readers understand the project (e.g., instruments, curriculum, working sheets)</li> </ul>	<ul style="list-style-type: none"> <li>-Attach only part of relevant information that help readers understand the project (e.g., instruments, curriculum, working sheets)</li> </ul>
Mechanics of English	<ul style="list-style-type: none"> <li>-Appropriate expression of concepts, varied and accurate vocabulary, no errors occur with regards to grammar, conventions and spelling.</li> <li>-Follow APA format</li> </ul>	<ul style="list-style-type: none"> <li>-Clear expression and vocabulary, some mechanical errors exist but not to get in the way of understanding.</li> <li>-Have some APA format errors</li> </ul>	<ul style="list-style-type: none"> <li>-Some mechanical errors exist but not to get in the way of understanding.</li> <li>-Many errors with regards to grammar, spelling, and conventions.</li> <li>-There is no obvious APA formatting structure</li> </ul>