

**Mississippi Valley State University**  
**Department of Natural Sciences & Environmental Health**  
**Water Chemistry (EH 520)**

Instructor: Dr. Hattie B. Spencer

Lecture: M ( 6:00-7:20 pm) Lab: M (7:40-9:20 pm)

Office Location: 2219: Class Location: STB/2209

Office Phone (662) 254-3391

Office Hours: MW 1-3 pm; T 9am-12pm; R 9am-12pm (**By appointment only**)

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**Prerequisites:** Graduate Standing and basic background in Chemistry

**Credit hours: 4**

**Required Textbook:** Faust, Samuel D., Aly, Osman M. Chemistry of Water Treatment (2<sup>nd</sup> Edition). CRC Taylor & Francis Group

**Supplemental Reading:** Hammer, Mark J., Water and Wastewater Technology (7<sup>th</sup> Edition). Prentice Hall Publishers

### **Course Description**

The Water Chemistry course is designed to develop a familiarity with the movement of water in the environment as well the chemical processes that will occur in water type environments. Students will learn about water quality and the various parameters that affect water quality as well as how to test for these effects. The course will review regulations that control how man interacts with water systems and water pollution control systems. This course involves review of general chemistry, aquatic biology, hydrology, water quality parameters and water processing technologies

### **COURSE OBJECTIVES:**

Water Chemistry (EH 520) is a graduate course designed to give students a basic understanding of the water analysis and methods used for water treatment. Upon completion of this course, all students should be able to:

1. Explain the major applicable laws and regulations of the United States pertaining to drinking water quality and standards.
2. Recognize, characterize, and categorize waterborne contaminants, their sources, and health effects.
3. Describe the wastewater treatment process and alternatives methods for water and wastewater treatment.
4. Understand the physical properties of water and parameters that impact water quality

5. Solve problems and communicate the solutions written or orally

## Core Competencies Covered in the Course

### 1. Assessment

- 1A. Information Gathering: The capacity to identify sources and compile relevant and appropriate information when needed, and the knowledge of where to go to obtain the information.
- 1B. Data analysis and Interpretation: The capacity to analyze data, recognizes meaningful test results, interpret results, and present the results in an appropriate way to different types of audiences.
- 1C. Analyzes and synthesizes data to enhance decision making for the practice of environmental health.

### 2. Management

- 2A Problem Solving: The capacity to develop insight into and appropriate solutions to environmental health problems
- 2E. Computer/Information Technology: The capacity to use information technology as needed to produce work products.

### 3. Communication

- 3A. Educate: The capacity to use the environmental health practitioner’s front-line role to effectively educate the public on environmental health issues and the public health rationale for recommendations.
- 3B. Communicate: The capacity to effectively communicate risk and exchange information with colleagues, other practitioners, clients, policy-makers, interest groups, media, and the public through public speaking, print and electronic media, and interpersonal relations.

**When student complete this course, they should be able to:**

Objectives	MVSU EH Competency	EHAC Competency	Evaluation
Explain the major applicable laws and regulations of the United States pertaining to drinking water quality.	1A, 2E, 3B	Analytical, Communication skills, Natural Sciences, Toxicology, General EH, Specialized EH, Statistical Analysis and Risk assessment	Quizzes, Exams, Articles I-IV, Student led discussions, Oral presentations and Research Paper
Recognize, characterize, and categorize waterborne contaminants, their sources, and	1A, 2E, 3B	Analytical, Research Methods, Communication skills, Natural Sciences, Toxicology, General EH,	Quizzes, Exams, Articles I-IV, Student led discussions, Oral

health effects.		Specialized EH, and Risk assessment	presentations and Research Paper
Describe the wastewater treatment process and alternatives methods for water and wastewater treatment.	1A, 2E, 3B	Analytical, Research Methods, Communication skills, Natural Sciences, Toxicology, General EH, Specialized EH, and Risk assessment	Quizzes, Exams, Articles I-IV, Student led discussions, Oral presentations and Research Paper
Understand the physical properties of water and parameters that impact water quality and apply some of the basic analytical techniques	1A, 1B, 2E, 3A, 3B	Analytical, Research Methods, Communication skills, Natural Sciences, Toxicology, General EH, Specialized EH, and Risk assessment	Quizzes, Exams, Articles I-IV, Student led discussions, Oral presentations and Research Paper
Solve problems and communicate the solutions written or orally	1A,1B, 1C 2A,3B	Analytical, Communication skills, Natural Sciences, Toxicology, General EH, Specialized EH, and Risk assessment	Quizzes, Exams, Articles I-IV, Student led discussions, Oral presentations and Research Paper

### Course Calendar Schedule (\*\*Tentative)

*\*\*Please note that other topics maybe added at the instructor discretion*

Date (Week of.)	Lecture	Chapters	Problems/Questions
<b>Syllabus</b>			
27 August	Introduction/History of Water and Waste Treatment	Chapter 1 : Introduction (Hammer)	Lecture/Class Discussion
September 10	Article I: Water Quality in Underdeveloped Countries	<b>Article I Due:</b>	Briefly discuss Article findings
September 10	Chemistry	Chapter 2 (Hammer)	2-1,2-2,2-5,2.7 Page 37 (Hammer)
	<b>Quiz 1</b>		
September 17	Biology	Chapter 3 (Hammer)	3-1-3-10,3-32,3-33 Pages 69, 70 <b>Problems Due for Chapter 2</b>
	<b>Exam 1 (1 &amp; 2)</b>		
September 24	Criteria & Standards for Drinking Water Quality	Chapter 1 (Faust)	<b>Problems Due for Chapter 3</b>

<b>October 1</b>	<b>Mid-Term</b>	<b>Chapters 1, 2, 3, including Faust: 1</b>	
October 8	Water Quality	Chapter 5 (Hammer)	
	<b>Submit Topic &amp; Outline for Research Paper: Approval Needed</b>		
October 8: Class Discussion	<b>Hydrofracking Impact on Water Quality and Human Health</b>	<b>Article II Due</b>	<b>Rubrics for Oral Presentation</b>
October 15	Tastes and Odors in Drinking Water/	Chapter 3 (Faust)	
October 22	Water Processing	Chapter 7 (Hammer)	<b>7-1,7-2,7-3</b>
	<b>Quiz 2</b>		
October 29	Water Processing	Continue	Questions Due  <b>Rubrics for Written Presentation</b>
	<b>Submit Draft Research Paper</b>		
	<b>Exam 2</b>		
<b>November 5</b>	Removal of Pathogenic Bacteria, Viruses, and Protozoans	Chapter 11 (Faust)	
	<b>Microorganisms in Drinking Water</b>	<b>Article III Due:</b>	
November 12	Water Reuse	Chapter 14 (Hammer)	<b>14-1-14-8.</b>
	<b>Submit Research Paper</b>		
<b>November 19-23</b>	<b>Fall Break &amp; Thanksgiving</b>		
<b>November 26</b>	<b>Final Exam (Option to take December 3 as a class)</b>	<b>Comprehensive</b>	

**\*\*\*Powerpoint presentation will be required for research paper. Student presentation will be schedule for October 22, November 5, and November 12. Let me know the date you will present. A rubric will be given prior to presentation.**

<b>Criteria for Grading:</b>	<b>% Final Grade</b>	<b>Grading Scale</b>
Periodic Exams	30%	90-100% A
Final Exam (Comprehensive)	30%	80-89% B
Quizzes/Assignment	10%	70-79% C
Term Paper	20 %	60-69% D
Presentation	10 %	Below 60% F

## **Grade Appeals:**

Any student who believes that s/he has been graded unfairly, even after talking with me about the grade, may appeal that grade by following University procedures as explained in the Student Handbook. Please keep records of all graded assignments and make all appeals in writing with the proper documentation. It is the student's responsibility to prove that s/he has been graded unfairly.

## **Grade of Incomplete**

Students should refer to the Graduate Catalog 2017-2019 for requirements to receiving a grade of "I" (Incomplete). Please note that this grade is given at the instructor's discretion, and not by the student's decision. In addition to the condition set by the University, It is a requirement that a request for an incomplete be in writing. This request should meet the conditions outline in the graduate catalog. A grade of a D or F received in a graduate level course requires that the course must be repeated.

## **Conference (s)**

Students should take advantage of the Instructor's office hours for conference (s) and when extra help is needed. When a student fails a quiz or exam (s), this should be an immediate office visit. Students that cannot meet during the regular office hours should send an email with the requested date and time of conference. Grades reflect time and efforts a student place toward his/her education.

## **Make-Up Policy**

No make-up tests will be given except in cases of an immediate family member's death or illness and grave personal illness. A valid excuse should be submitted upon return to class. Make-up tests and quizzes must be taken no later than the second-class meeting after the test. If tests are not made up within the allotted time frame, the grade will become a zero. **NO EXCEPTION.** All quizzes will be given at the beginning of the class period. If a student is tardy, he/she will not be able to take the quiz.

**Class Attendance:** (SEE CLASS ATTENDANCE POLICY from the Mississippi Valley State Catalog). Regular and punctual attendance is expected of all students in all scheduled classes and activities. Instructor will keep attendance and conference records for all students. Any absence for which a student does not provide written official excuse is counted as an unexcused absence. It is the responsibility of the student to notify the instructor (prior to class meeting) if he/she is unable to attend. Students must understand that even with an official excuse of absence, a student is responsible for assignments during their absence.

## **Academic Integrity Policy**

All acts of academic dishonesty, including, but not limited to, cheating on exams, plagiarism, internet papers, paraphrasing internet papers, presenting someone else's work as your own,

failing to meet academic and professional requirements, will result in an automatic “F ” The University’s academic honesty and plagiarism are enforced in this course (Student Handbook)

**NOTE:** Violation of academic integrity will be handled according to Mississippi Valley State University policy.

### **Cell Phone**

All cell phones and beepers must be turned off or in the vibration mode. To prevent interrupting instructor and fellow students, please check cell phones and beepers before entering into the classroom. **No cell phone should be used during exams. Student will be excused from or receive an “F” for the exam if violation occurs.**

### **Analysis for Journal Articles (Critique)**

1. Identify your article by title, author and source
2. Review the content of the article, summarize its main points. What is the problem/issue/argument that this article is reflecting.
3. Identify how this article relates to the field of public health, what area of public health it deals with and tell why the article may be of importance in the field. Relate the article to the chapters covered in class.
4. Articulate the meaning and thought you have derived from the article. Does it have any special importance to you or to a particular segment of society? Why? You must show that you have thought about the article. Do you question the results or conclusions that the article draws? Do you feel the article or the research it reports on was lacking in some way?
5. Please follow instructions and watch grammar, spelling, etc. Please proofread before submission.
6. Remember, late articles will not be accepted. Critiques are due at the beginning of class on the schedule date.
7. All articles should be font 12 point Time Roman

### **References:**

You should have a total of at least 4 references

Two of your references must be journal articles, one of your references must be a book and the other reference may be from an internet source. The critique must conform to Chicago style edition guidelines. Below are some guidelines regarding Chicago style. For more detail, you can go to the following URL: <http://www.lib.berkeley.edu/instruct/guides/chicago-turabianstyle.pdf>. Please remember, you must cite all work of the authors each time you make reference to them. If you have not properly referenced the author, it may be considered as plagiarism. Please review student handbook on this matter.

## Guideline for Writing Research Paper

A 10 page paper (final version) is schedule to be submitted (see course schedule outline). The bibliography nor title page should be counted as a part of the 10 page paper. Graphs and tables should go in the appendix. Student must receive prior approval for topic and outline. It would be good to submit a rough draft before submitting the final paper, but it is at your discretion Journals are available online through MVSU library (Journal of American Water Works Association, etc.). Graduate level work is expected for all assignments. Again, students are to perform an in-depth research into a topic approved by the instructor before advancing to the next step.

Length of Paper: 15 pages, (not including bibliography)

Structure

- Title page
- Table of contents
- Introduction
- Literature Review
- Methodology
- Results (graphs and tables in the appendix)
- Discussion
- Conclusion
- Bibliography
- Appendix (graphs, tables, etc.)

### **Style Guidelines**

Minimum of 15 pages in length

Typed, double spaced

1 inch margins all around (top, bottom and both sides)

Font size: 12-point Time Roman

Proofread and spell check paper

Please use a folder rather than a binder

You are encouraged to use the services of the Writing Center at MVSU

A Manual for Writers of Term Papers, Theses, and Dissertations. 7th ed. Chicago: University of Chicago Press, 2007. ISBN 0226823369 (**APA Style is required**).

When using internet material, make sure it comes from a reliable source. Wikipedia is unreliable and should not be a part of the reference. I prefer that the majority of the information is retrieved from reference material such as journals, book, periodicals, etc.

*A Manual for Writers of Term Papers, Theses, and Dissertations*. 7th ed. Chicago: [University of Chicago Press](#), 2007. [ISBN 0226823369](#)

## **Services for Students with Disabilities (SSD)**

Mississippi Valley State University is committed to providing reasonable accommodations for students with a documented disability. If you feel you are eligible to receive accommodations for a covered disability (medical, physical, psychiatric, learning, vision, hearing, etc.) and would like to request it for this course, you must be registered with the Services for Students with Disabilities (SSD) program administered by University College. It is recommended that you visit the Disabilities Office located inside the EMAP Computer Lab in the Technical Education (IT) Building to register for the program at the beginning of each semester. If you are determined to be eligible after your confidential consultation, you will be provided with a Memo of Accommodations that must be submitted to each of your instructors.

For more information or to schedule an appointment, please contact Mr. Billy Benson, Jr. via phone or email at 662-254-3005 or [billy.benson@mvsu.edu](mailto:billy.benson@mvsu.edu).

