Experience the Public Health Laboratory  
Summer Field Experience, Global Health Certificate Program
Nutritional Sciences 421, section 001 
University of Wisconsin-Madison  
May 21-25, 2018

Lead Instructor: Patrice Held, PhD  
Assistant Professor, Department of Pediatrics  
Affiliate Professor, Department of Population Health Sciences  
Co-director, Newborn Screening and Director, Biochemical Genetics Laboratories, Wisconsin State Laboratory of Hygiene  
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patrice.held@slh.wisc.edu

Office Hours: 20 minutes before and after class  
Class Time: 1-week summer course (3 in class hours each day for 5 days)  
Class Location: 465 Henry Mall and 2601 Agriculture Drive  
Course Credits: 1 credit

Intended Students: Undergraduates in biological sciences  
Enrollment in undergraduate global health certificate program

Pre-requisites: An introductory level course in biology and chemistry is preferable
Additional courses in genetics, organic chemistry, biochemistry, and environmental health are not a pre-requisite, but will enhance the students learning experience in this class.

Course Description:
The public health laboratory plays a vital role in keeping communities and the environment healthy and safe. Specifically, the laboratory provides testing which can be used to identify and prevent the spread of diseases, monitor outbreaks, and provide surveillance. Students enrolled in this course will learn about the large breadth of testing offered and how the testing is used to impact public health. Topics include communicable diseases, environmental testing, newborn screening, and forensic toxicology.

Learning Outcomes:
The learning outcomes of this course are to:
- Delineate the role of the public health laboratory in identifying, managing, and monitoring acute and chronic public health challenges within local communities, state and regional areas, and expanding beyond to our global partners.
- Identify connection between the type of testing offered, the results obtained, and the direct application of the information provided by the laboratory to a public health concern.
- Recognize the basic principles of chemistry, molecular biology, immunology, and microbiology as it applies to public health assessments.
- Using examples, describe how testing for various conditions or exposures may be altered within different countries depending upon the specific needs of the population and the access to resources.

These learning outcomes will be met through readings, lectures, case studies, discussions, and reflections. These learning objectives will be assessed through short daily quizzes that emphasize
key concepts presented in the lectures and an evaluation of the student’s participation in the class discussions. Students will also be required to submit a final paper discussing a current concern/condition affecting public health, both locally and globally, and how laboratory testing has plays a role in the outcome, management and treatment/containment.

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>Topic</th>
<th>Assessment</th>
<th>Location</th>
<th>Lecturer</th>
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</thead>
<tbody>
<tr>
<td>May 21</td>
<td>9-9:30</td>
<td>Introduction to Course</td>
<td>5pt quiz to emphasize key concepts presented in lectures</td>
<td>465 Henry Mall</td>
<td>Jan Klawitter</td>
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<tr>
<td>Monday</td>
<td>9:30-10:30</td>
<td>Introduction to the Public Health Laboratory</td>
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<td>2nd floor conference room</td>
<td>Patrice Held</td>
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<td></td>
<td>10:30-12</td>
<td>Newborn Screening (Lecture/Lab Tour)</td>
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<td>May 22</td>
<td>9-10</td>
<td>Newborn Screening (Discussion/Journal Articles)</td>
<td>5pt quiz to emphasize key concepts presented in lectures</td>
<td>465 Henry Mall</td>
<td>Patrice Held</td>
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<td>Tuesday</td>
<td>10-11</td>
<td>Emerging Viral Diseases and the threat to global health (lecture)</td>
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<td>2nd floor conference room</td>
<td>Erik Reisdorf</td>
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<td></td>
<td>11-12</td>
<td>Emerging Viral Disease (Discussion/Journal Articles)</td>
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<td>May 23</td>
<td>9-10:30</td>
<td>Foodborne Disease Outbreaks and Surveillance (Lecture)</td>
<td>5pt quiz to emphasize key concepts presented in lectures</td>
<td>2601 Ag. Drive Board Room</td>
<td>Tim Monson</td>
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<td>Wednesday</td>
<td>10:30-11</td>
<td>Foodborne Disease (Lab Tour)</td>
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<td>Rachel Klos</td>
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<td>11-12</td>
<td>Foodborne Disease (Discussion/Journal Articles)</td>
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<td>May 24</td>
<td>9-10</td>
<td>Testing for environmental exposures (Lecture)</td>
<td>5pt quiz to emphasize key concepts presented in lectures</td>
<td>2601 Ag. Drive Board Room</td>
<td>Noel Stanton</td>
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<td>Thursday</td>
<td>10-11</td>
<td>Selected topic: Lead poisoning (Discussion/Journal Articles)</td>
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<td>11-12</td>
<td>Occupational Health (Lecture/Lab Tour)</td>
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<td>Steve Streb</td>
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<td>May 25</td>
<td>9-10</td>
<td>Forensic Toxicology (Heroin testing, drug trends, and blood alcohol testing) (Lecture)</td>
<td>5pt quiz to emphasize key concepts presented in lectures</td>
<td>2601 Ag. Drive Board Room</td>
<td>Amy Miles</td>
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<td>Friday</td>
<td>10-10:30</td>
<td>Forensic Toxicology (Lab Tour)</td>
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<td></td>
<td>10:30-11:30</td>
<td>Forensic Toxicology (Discussion/Journal Articles)</td>
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<td></td>
<td>11:30-12</td>
<td>Course summary and evaluation</td>
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<td>Patrice Held</td>
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**Course Credit Hours:**

*In-class (Total 15 hours)*
- Faculty led lectures: 8.0 hours
- Laboratory Observations: 2.0 hours
- Class Discussions: 5.0 hours

*Outside class (Total 30)*
- Quizzes, daily reflections, and review of presented class material: 10 hours
- Supplemental reading assignments/journal articles: 10 hours
- Integration of knowledge, writing assignment: 10 hours

**Required Readings and Class Discussion:**
The required readings can be found on the Learn@UW website. The selected readings will supplement the lecture topics by providing additional information.

In addition to required reading, one to two articles will be selected each day for the discussion hour that highlight how the public health concern is address both locally and/or globally through the use of laboratory generated data. Students will be asked to read the selected articles prior to coming to class and be prepared to participate in the class discussion of selected paper(s). Students will be evaluated on their preparation (reading of selected articles) and participation in class discussion, through thoughtful questions and comments. Students may wish to prepare questions ahead of time to facilitate the discussion. See attached rubric for evaluating participation.

**Daily Quizzes:**
The purpose of the daily quizzes is to emphasize key concepts introduced in lecture and discussion. Students will be asked to complete these quizzes at home. The quiz will be offered once the daily class has ended and must be completed prior to the start of the next class period.

**Daily Reflections:**
The purpose of the daily reflection is to have students, in their own words, answer a reflection question based upon the daily lecture topic. It is aimed to be a free thought experiment (not graded) but used to further in class discussion and generate ideas for the final paper. Students will be asked to share their thoughts with other students in the class.

**Final Paper:**
For the final paper, students will be asked to select a current concern/condition affecting public health in which the laboratory plays a critical role in identifying, managing, or monitoring the spread of disease and/or contamination. The selected topic should be discussed in the student’s own words and the following should be included in the paper:

- a brief introduction to a current public health concern/condition,
- an overview of the testing offered by local, state, or federal public health laboratories to identify or monitor the concern/condition, specifically including how the results obtained from testing are used to positively modify the public health outcomes
- a review of how other countries are addressing this public health condition/concern, including how testing may be altered depending upon the specific needs of the population and/or access to resources
• a speculation on how current research in the topic might impact the role of the public health laboratory on the spread of the exposure/condition in the future

The student should use 2-4 references (at least 2 peer-reviewed papers must be included along with citations from reputable websites, such as those from government, academic, or other well-established organizations) and the paper should not exceed 3 single spaced pages (not including references; size 8.5 x 11; 1 inch margins; minimum font size of 11). It will be due one week after the last day of class.

**Evaluation:**

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<tr>
<th>Total Points</th>
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<tr>
<td>Quiz/assessment of key concepts</td>
<td>10</td>
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<tr>
<td>Class Discussion/Reflection Participation</td>
<td>40</td>
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<tr>
<td>Final Paper</td>
<td>50</td>
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The grading scale will be:

93-100 = A  
88-92 = AB  
83-87 = B  
78-82 = BC  
70-77 = C  
60-69 = D  
Below 60 = F

**Guidelines for Evaluating Participation**

**Outstanding Contributor:** Contributions in class reflect exceptional preparation. Ideas offered are always substantive, provide one or more major insights as well as direction for the class. Challenges are well substantiated and persuasively presented. If this person were not a member of the class, the quality of discussion would be diminished markedly. (Outstanding contributors will receive full credit = 40 points.)

**Good Contributor:** Contributions in class reflect thorough preparation. Ideas offered are usually substantive; provide good insights and sometimes direction for the class. Challenges are well substantiated and often persuasive. If this person were not a member of the class, the quality of discussion would be diminished. (Good contributors will receive 32 out of 40 points.)

**Adequate Contributor:** Contributions in class reflect satisfactory preparation. Ideas offered are sometimes substantive, provide generally useful insights but seldom offer a new direction for the discussion. Challenges are sometimes presented, fairly well substantiated, and are sometimes persuasive. If this person were not a member of the class, the quality of discussion would be diminished somewhat. (Adequate contributors will receive 24 out of 40 points.)

**Non-Participant:** This person says little or nothing in class. Hence, there is not an adequate basis for evaluation. If this person were not a member of the class, the quality of discussion would not be changed. (Non-participants will receive 16 out of 40 points.)
**Unsatisfactory Contributor:** Contributions in class reflect inadequate preparation. Ideas offered are seldom substantive; provide few if any insights and never a constructive direction for the class. Integrative comments and effective challenges are absent. If this person were not a member of the class, valuable air-time would be saved. (Unsatisfactory contributors will receive 8 out of 40 points.)

The source of this rubric is the UW-Madison Writing Across the Curriculum website authored by Professor Virginia Sapiro. It was developed by Professor John Tyler of Brown University who obtained these guidelines from Professor Richard J. Murnane at the Harvard Graduate School of Education. Professor Murnane, in turn, learned of them from someone else (although the original attribution for the guidelines has been lost).

**Course environment and academic integrity/misconduct:**

**Collaborative Environment & Academic Misconduct:**
The students leading a journal discussion must work together to some extent; the students not leading the journal discussion are expected to read and write-up a summary and discussion questions/points on their own with minimal discussion with other students (please save all your good discussion for inside the classroom so others may benefit from it too!). The final paper MUST reflect only individual work. This is equivalent to a final take-home exam and should NOT be worked on or discussed with other students until after the paper has been turned in by all students. Students are expected to attend every class and stay for the entire scheduled class time unless extreme circumstances arise. Please let us know before class if you will be unable to attend due to such circumstances.

Please refer to this website if you have questions about student misconduct:
http://www.wisc.edu/students/saja/misconduct/misconduct.html

**Non-Discrimination Policy**
The UW–Madison is committed to creating a dynamic, diverse and welcoming learning environment for all students and has a non-discrimination policy that reflects this philosophy. Disrespectful behaviors or comments addressed towards any group or individual, regardless of race/ethnicity, sexuality, gender, religion, ability, or any other difference is deemed unacceptable in this class.

**Special Needs or Disabilities**
We wish to fully include persons with special needs or disabilities in this course. Please let Dr. Held know as soon as possible if you need any special accommodations in the curriculum, instruction, or assessments of this course to enable you to fully participate.

**Civility Policy**
Members of the University of Wisconsin-Madison community are expected to deal with each other with respect and consideration. The civility policy for this course promotes mutual respect, civility and orderly conduct among and between the faculty and students. This policy is not meant to deprive any person of his or her right to freedom of expression. Rather, we seek to maintain a safe, harassment-free work-place for the students and faculty. Positive communication is encouraged and volatile, hostile, or aggressive actions and language will not be tolerated. If the civility policy for this course is violated, the individual will be subject to removal from the class and possibly the course altogether. In addition, the proper authorities at the UW Departmental, School, and University levels will be notified of such behavior accordingly and further action may be taken if necessary.