Duke Global Health Institute
One Health: Public Health Laboratory Techniques
GLHLTH 739
Summer 2017, 1 Credit Hour

Instructor Information

Nancy Henshaw, PhD and Benjamin Anderson, MPH, PhD
Office hours: arranged

Course Description

Introduction to common laboratory techniques used in emerging infectious respiratory disease research and surveillance laboratories; emphasis on techniques for culturing, characterization, and serological surveillance of exposure to influenza viruses.

One semester credit hour class

Course Objectives and/or Goals

At the end of the course the student will be able to:

1. Understand the laboratory skills used in identifying, culturing and characterizing infectious agents;
2. Describe the serological procedures involved in detecting previous infection with infectious agents;
3. Apply above laboratory techniques with a special emphasis on influenza A viruses; and
4. Understand the methods described above as well as the analysis and reporting of data resulting from their use.

Course Materials

There is no specific textbook for this course. Students will be provided with handouts and laboratory exercises that correspond to classroom activities.

Date       Time             Room
5/22/2017 Mon 1:30pm-5:30pm  Wet laboratory tbd
5/23/2017 Tue 1:30pm-5:30pm  Wet laboratory tbd
5/24/2017 Wed 1:30pm-5:30pm  Wet laboratory tbd
5/25/2017 Thu 1:30pm-5:30pm  Wet laboratory tbd
5/26/2017 Fri 1:30pm-5:30pm  Wet laboratory tbd
Course pre-requisite

Before reporting to class students must complete the online courses Basic Biological Safety and Blood Borne Pathogens for College of Public Health. Certification of completed courses must be brought to class.

Course Requirements/Evaluation/Grading

Students will be graded on a standard letter scale of A to F. Students will be evaluated by their class participation (50%) and a final open-note, short answer/ essay exam (50%). Students who fully participate and attend every session will earn at least a B for the class participation portion of the overall grade. To earn an A in class participation, students must attend each session and demonstrate that they prepared for lectures beforehand (through familiarity with assigned readings, interacting with the lecturers, and actively participating in group exercises).

<table>
<thead>
<tr>
<th>Percentage or points earned in class</th>
<th>93%-100%</th>
<th>90%-92%</th>
<th>87%-89%</th>
<th>83%-86%</th>
<th>80%-82%</th>
<th>77%-79%</th>
<th>73%-76%</th>
<th>70%-72%</th>
<th>Below 70%</th>
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<tbody>
<tr>
<td>Letter Grade equivalent</td>
<td>A</td>
<td>A-</td>
<td>B+</td>
<td>B</td>
<td>B-</td>
<td>C+</td>
<td>C</td>
<td>C-</td>
<td>F</td>
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For greater detail on the meaning of letter grades and university policies related to them, see [https://registrar.duke.edu/student-records/how-calculate-gpa](https://registrar.duke.edu/student-records/how-calculate-gpa)

Topical Outline

<table>
<thead>
<tr>
<th>Day</th>
<th>Title</th>
<th>comments</th>
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<tbody>
<tr>
<td>1</td>
<td>Biosafety / laboratory skills primer. Introduction to viral culturing methods Influenza viral RNA (vRNA) isolation from clinical samples inoculation of embryonated chicken eggs</td>
<td>~ 4hrs</td>
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<tr>
<td>2</td>
<td>Reverse Transcription (RT) to make cDNA from vRNA Gene segment specific PCR from RT products Detection of influenza A in tissue culture direct fluorescent antibody staining Hemagglutination of influenza viral antigens</td>
<td>~4 hrs</td>
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<td>3</td>
<td>Agarose gel electrophoresis of gene segment specific PCR Real-time RT-PCR and subtyping of influenza A specimens from humans Standardization of influenza A antigen for use in Hemagglutination Inhibition</td>
<td>~4 hrs</td>
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<tr>
<td>4</td>
<td>Analysis of Real-time PCR Harvest of infected Eggs Hemagglutination Inhibition Assays (HI) Rapid tests for identification of influenza A virus in clinical specimens</td>
<td>~4 hrs</td>
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<tr>
<td>Day</td>
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<td>comments</td>
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<tr>
<td>5</td>
<td>Lecture on viral-neutralization procedure for influenza</td>
<td>~3.5 hrs</td>
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<td></td>
<td>Review</td>
<td></td>
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<td></td>
<td>Open-notes, multiple choice examination</td>
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**Duke Honor Code**
Duke University is a community dedicated to scholarship, leadership, and service and to the principles of honesty, fairness, respect, and accountability. Citizens of this community commit to reflect upon and uphold these principles in all academic and non-academic endeavors, and to protect and promote a culture of integrity. To uphold the Duke Community Standard:
- I will not lie, cheat, or steal in my academic endeavors;
- I will conduct myself honorably in all my endeavors; and
- I will not act if the Standard is compromised.

Students are encouraged to review the Duke Honor Code: [http://www.integrity.duke.edu/new.html](http://www.integrity.duke.edu/new.html)

**Plagiarism**
Plagiarism, of any kind, is not be acceptable and will result in an automatic failure and possible additional disciplinary action.

See Duke Guidelines for plagiarism: [http://library.duke.edu/research/plagiarism](http://library.duke.edu/research/plagiarism)

**Attendance Policy**
Attendance is mandatory.

**Policy Related to Make-up Exams or Other Work**
*Attendance and Make-up Work* – I expect you to attend and be prepared to participate in all class sessions. Personal issues with respect to class attendance or fulfillment of course requirements will be handled on an individual basis.