

# BISP 194 / BGGN 285 – Contagion: Molecular Epidemiology of Infectious Diseases

Fall 2019:

Tuesdays

11:00 am – 12:20 pm

York Hall 3010

Instructor:

Professor Joel O. Wertheim

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Office Hours: by appointment

**Summary.** In this course, we will explore the factors that underlie the emergence, epidemiology, and evolution of infectious diseases. We will use the 2011 feature film “Contagion” as an entry point to understanding how we can use molecular tools to understand and combat these emerging threats. Students will read and discuss the primary literature describing the current state of the field, with a particular focus on viral pathogens.

**Purpose.** To provide you with the opportunity to expand your knowledge of biology by reading, analyzing, and discussing the primary literature related to molecular epidemiology of infectious diseases.

**Grading.** This course will be conducted in a seminar format. Your responsibilities in this course are to (i) do the weekly readings, (ii) submit questions in advance, (iii) show up to class, and (iv) meaningfully engage in classroom discussion. Your grade breakdown is as follows: attendance (10%), question submission (25%), classroom participation (65%). Grades will be assigned: A, A-, B+, B, C, D, or F.

**Weekly Responsibilities.** Every week, you are to do the assigned reading(s) for that week. For each assigned article, you must submit written questions via Canvas. These questions must be submitted by 6 pm the Monday before class. Questions submitted after this deadline will be scored accordingly. You will be expected to ask your questions in class and answer those posed by other students. Bring a digital or hard-copy of all assigned readings with you to class. I will guide the discussion, not lead it.

**BGGN 285 Additional Responsibilities.** Each BGGN 285 Master’s student is required to give a 15 minute “PowerPoint” presentation on an assigned article. This presentation will provide a concise overview of the study, its motivations, design, and findings. This presentation will constitute 25% of your grade. Keeping to the time-limit is an important part of this presentation.

## COURSE OUTLINE AND READING ASSIGNMENTS

| <b>Date</b> | <b>Topic</b>                     | <b>Readings</b>                                |
|-------------|----------------------------------|--|
| October 1   | Welcome: Contagion               | –  |
| October 8   | Introduction to Epidemiology     | Contagion (Film)<br>Luby 2006<br>Wertheim 2017 |
| October 15  | Phylogenetics                    | Baum 2005<br>Worobey 2016*                     |
| October 22  | Contagion Revisited              | Contagion (Film)                               |
| October 29  | $R_0$ & Virulence                | Fraser 2014<br>Dudas 2018*                     |
| November 5  | SIR                              | du Plessis 2015<br>Rasmussen 2018*             |
| November 12 | Adaptive Immunity                | Worobey 2014*                                  |
| November 19 | Epidemic Intelligence Service    | Cohen 2014                                     |
| November 26 | Real-time Molecular Epidemiology | Poon 2016<br>Dudas 2017*                       |
| December 3  | Infections Past and Future       | Duggan 2016<br>Wagner 2014                     |

\* indicates an article that will be presented by a BGGN 285 Master's student

Please note that this schedule includes guest speakers. In case of cancellation, weekly readings may be shifted to accommodate a modified schedule.