# **2022 SISMID: Mathematical Models of Infectious Disease**

**(Tentative schedule)**

Instructors: Micaela E. Martinez (Emory University) & Matt Ferrari (Penn State University)

TAs: Tiggy Menkir & Deepit Bhatia

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July 11, Monday: 11 a.m.- 5:30 p.m. EST

July 12, Tuesday: 11 a.m. – 5:30 p.m. EST

July 13, Wednesday: 11 a.m. – 2 p.m. EST

**Course Materials:**

Web link TBD

**Zoom Sessions:**

**DAY 1**

Meeting ID: TBD

Passcode:

**DAY 2**

Meeting ID: TBD

Passcode:

**DAY 3**

Meeting ID: TBD

Passcode:

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## **Before Class**

Make sure you have R installed on your computer:<https://www.r-project.org/>

Make sure you have a basic text editor or R Studio to work on R code.

<https://www.rstudio.com/>

If you use a text editor, Sublime is recommended, installed on your computer:<https://www.sublimetext.com/>

Familiarize yourself with R basics. Here is an optional tutorial (also available on the course materials website):<https://strata.uga.edu/software/pdf/Rtutorial.pdf>

Background reading Heesterbeek et al. 2015 (also available on the course materials website):<https://science.sciencemag.org/content/347/6227/aaa4339.abstract>

### **ZOOM OFFICE HOURS:**

Monday July 11th - 11 am-11:30pm EST

## **DAY 01 – Monday**

11 am-11:30pm EST - Office Hours

11:30-12:30pm EST - Intro lecture by Micaela Martinez

12:30-12:40pm EST - Break

12:40-1:40pm EST - Basic dynamics in SIR models lecture by Matt Ferrari (i.e., single epidemic curve, seasonal outbreaks, long term dynamics and intro to modeling)

1:40pm- 2:40 pm EST - “Lunch” Break

2:40-4pm EST - R session on intro to modeling by Tiggy Menkir

4pm- 4:10 pm EST - Break

4:10pm- 5:10pm EST - Vaccination & interventions lecture by Micaela Martinez

5:10pm- 5:30pm EST - Work on group assignment and slide deck

**DAY 02 – Tuesday**

11am- 12pm EST - Heterogeneity in SES lecture by Tiggy Menkir. The following paper is background reading:

<https://www.sciencedirect.com/science/article/pii/S0264410X21002917?via%3Dihub>

12pm- 12:10pm EST - Break

12:10- 1:40pm EST - Heterogeneity expanded to age structure and the force of infection lecture by Matt Ferrari

1:40-2:40pm EST - R session on heterogeneity and age structure and the force of infection

2:40-3:40 EST - “Lunch” Break

3:40-4:40pm EST - Parameter estimation lecture – estimating R0 by Matt Ferrari

4:40-5:30pm EST - R session on parameter estimation

**DAY 03 – Wednesday**

11:00am-12pm EST - Confronting models with data lecture by Micaela Martinez

12pm-12:10pm EST - Break

12:10pm-12:50pm EST - R session reflection and recap from groups

12:50-1pm EST- Break

1pm- 2pm EST - Stochasticity and Uncertainty lecture by Micaela Martinez and Matt Ferrari