Quantitative modeling is an essential component of modern research into the dynamics of infectious diseases. However, too few students of infectious disease biology have been trained to use advanced techniques in statistics, computer science, and mathematics. Though many students would be willing to develop their skills through self-study, they find the combination of mathematics, technical jargon, and the fundamental techniques of scientific programming to represent an insurmountable obstacle. These courses are intended to help these students and any others who would like to develop a basic understanding of infectious disease modeling to form the basis for further study, research, or forays into model-based decision-making and policy. We therefore welcome all students, whether designated through formal enrollment in university classes, or simply because all health professionals—whether scientists, practitioners, or policymakers—are always students by nature. Welcome to the University of Georgia.
Our computational workshops consist of two hands-on intensive modules involving a combination of lecture and laboratory practicums, providing students and research professionals with the background they need to frame biological questions in mathematical parlance, embark on analyses of these models, and work with a diverse array of data using advanced computational methods. Upon completion, attendees should be able to:

- Write code in R to perform research analysis
- Create reproducible workflows
- Extend understanding through independent study using web-based resources
- Express hypotheses as mathematical models
- Manipulate and analyze diverse data types
Introduction to Scientific Programming

Monday, May 13 - Tuesday, May 14 from 8:00-5:00
and Wednesday, May 15 from 8:00-12:00

Instructors: John Drake and Andrew Park

This module introduces the principles and practice of scientific computing with special emphasis on analysis of infectious disease data. Programming will be done in R. Students will be taught how to create reproducible research documents using R and R Markdown and to use git/Github for collaborative and individual projects. An introduction to scientific programming will teach basic operations and classes of base R, installation and use of R packages, data import and transformation, flow control with loops, writing functions, calculating summary statistics, data visualization, and basic mapping. The module will alternate between lectures and computer labs.

Modeling Infectious Diseases

Wednesday, May 15 from 1:00-5:00 and Thursday, May 16 - Friday, May 17 from 8:00-5:00

Instructors: John Drake and Pej Rohani

This module covers the principles of dynamic models of infectious diseases. The module will focus on the dynamics of compartmental models such as the susceptible-infected-recovered (SIR) model and variants (SI, SIRS, and SEIR). Topics include incorporating different types of heterogeneities in transmission (resulting from age-structure, behavior or, seasonality), exact stochastic birth-death models, sensitivity analysis, and fitting of simple models to data. The module will alternate between lectures and computer labs. Programming will be done in R.

John Drake, Instructor

John M. Drake is a Professor of Ecology and the Director of the Center for the Ecology of Infectious Diseases at the University of Georgia. His research seeks to understand the dynamics of biological populations and epidemics, focusing on how to bring experimental and observational data together with mathematical theory.

Andrew Park, Instructor

Andrew Park is an Associate Professor of Ecology at the University of Georgia. He develops theory to explain and predict population and evolutionary biology of host-parasite interactions.

Pej Rohani, Instructor

Pej Rohani is a Professor of Ecology and Infectious Diseases at the University of Georgia. His research is focused on using mathematical and computational approaches to study the population biology of infectious diseases.
**SCHEDULE**

**Introduction to Scientific Programming**  
**Module 1**

- Monday, May 13
  - 8:00 – 12:00: Instruction
  - 12:00 – 1:00: Lunch break
  - 1:00 – 5:00: Instruction

- Tuesday, May 14
  - 8:00 – 12:00: Instruction
  - 12:00 – 1:00: Lunch break
  - 1:00 – 5:00: Instruction

- Wednesday, May 15
  - 8:00 – 12:00: Instruction

  - End of Module 1

  - 5:30 – 7:00: Workshop Reception

**Modeling Infectious Diseases**  
**Module 2**

- Wednesday, May 15
  - 1:00 – 5:00: Instruction
  - 5:30 – 7:00: Workshop Reception

- Thursday, May 16
  - 8:00 – 12:00: Instruction
  - 12:00 – 1:00: Lunch break
  - 1:00 – 5:00: Instruction

- Friday, May 17
  - 8:00 – 12:00: Instruction
  - 12:00 – 1:00: Lunch break
  - 1:00 – 5:00: Instruction
Register here. For questions regarding registration, please contact: IDEAS@uga.edu or (706) 542-1930

*Register by April 25, 2019 at 11:59 PM to take advantage of this discounted rate.

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<thead>
<tr>
<th>Fee Structure</th>
<th>Early Bird*</th>
<th>Regular</th>
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<tr>
<td>Academic/govt.</td>
<td>$260</td>
<td>$310</td>
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<tr>
<td>General Registration</td>
<td>$340</td>
<td>$390</td>
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Attendees who complete a module will receive a certificate of completion in recognition of their participation.

Please note: These documents are not accredited and are not an endorsement of a degree at the University of Georgia.
FROM ATLANTA
The University of Georgia is a modest drive from Atlanta (approx. 1.5 hours).

For participants flying into Atlanta, there is also a shuttle service, Groome Transportation, which transports guests directly to the GA Center Hotel.

LOCAL TRANSPORTATION
For those without a car, the University and the city of Athens have excellent bus lines. Information concerning their routes can be found here and here. Uber and Lyft are also very reliable and inexpensive options as well.

LOCATION
The workshop will be held at the Odum School of Ecology, Computer Lab, Rm 29

140 E. Green St. Athens, GA 30602
ACCOMMODATIONS

We set aside a limited number of rooms at the Georgia Center Hotel* (located directly on campus) for our out of town guests at a discounted rate. Participants must contact the program coordinator directly to receive the discount code prior to making a reservation.

*Guests booking with the Georgia Center Hotel receive a complementary parking pass, shuttle service to popular Athens destinations, and access to the Ramsey Student Center.

Other hotels in close proximity (i.e., walking distance) to campus are as follows:

- Holiday Inn
- Hotel Indigo
- The Graduate

PARKING

Parking is available to non-UGA participants for a fee in the South Parking Deck. Fees are paid directly to the attendant on site. The deck is adjacent to the Georgia Center Hotel and is indicated on the map on the previous page.

FOOD

With the exception of our Wednesday night reception, meals are not included. However, there are many convenient options found on and off campus (several within walking distance). For a complete guide to Athens eateries, please see the Guide 2 Athens.

GUIDANCE

For further assistance regarding your travel, accommodations, etc., please contact IDEAS@uga.edu.
FUTURE SPONSORS

For organizations interested in engaging with our workshop community, please contact our development liaison at CEID@uga.edu.

Sponsoring partners are eligible to give presentations, distribute promotional materials, and network with highly-specialized graduate students, postdocs, and faculty working in infectious disease and computer modeling.

ENGAGEMENT STRUCTURE

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<td>(logo featured on all digital and print communications)*</td>
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<td>(sponsors engage with participants during evening reception)*</td>
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<td>Presentation</td>
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<td>(guests speak to workshop participants)*</td>
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*Complete details are available upon request.

CURRENT SPONSORS

The IDEAS Program and the Center for the Ecology of Infectious Diseases would like to thank the following partners for contributing to the realization of this workshop:

- The Odum School of Ecology
- The Department of Infectious Diseases
- The Office of Research